January 17, 1957

The IRON AGE

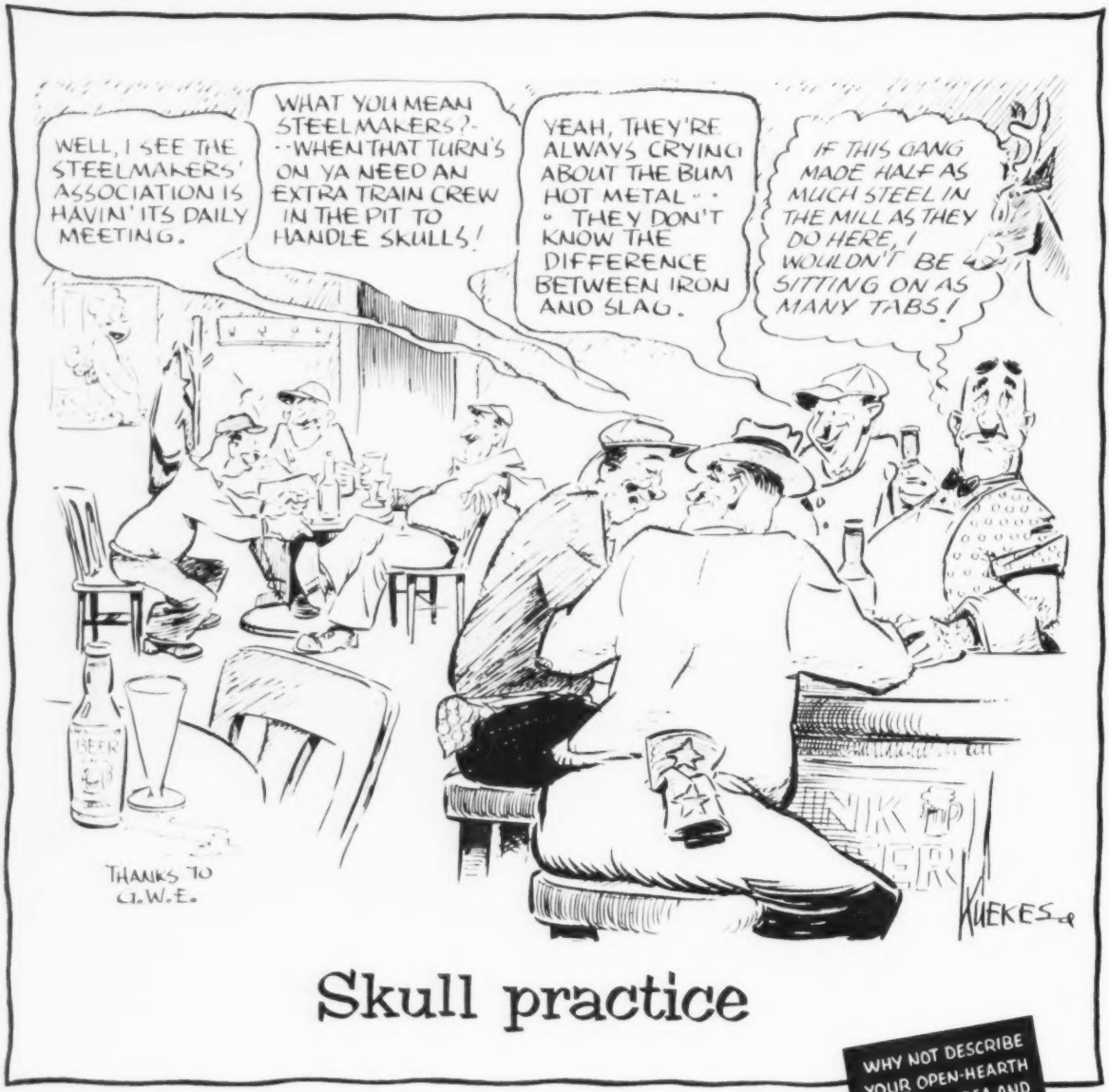
...ional Metalworking Weekly

Where Computers Fit In Metalworking P.71

Company Cars: Does Leasing Save Money? P.36

How Fast-Tax Veto Affects Steel Expansion P.31

Digest of the Week P–2


WELL, I SEE THE STEELMAKERS' ASSOCIATION IS HAVIN' ITS DAILY MEETING.
WHAT YOU MEAN STEELMAKERS?--WHEN THAT TURN'S ON YA NEED AN EXTRA TRAIN CREW IN THE PIT TO HANDLE SKULLS!
YEAH, THEY'RE ALWAYS CRYING ABOUT THE BUM HOT METAL . . . THEY DON'T KNOW THE DIFFERENCE BETWEEN IRON AND SLAG.
IF THIS GANG MADE HALF AS MUCH STEEL IN THE MILL AS THEY DO HERE, I WOULDN'T BE SITTING ON AS MANY TABS!
BEER
THANKS TO C.W.E.
KUEKES

Skull practice

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO

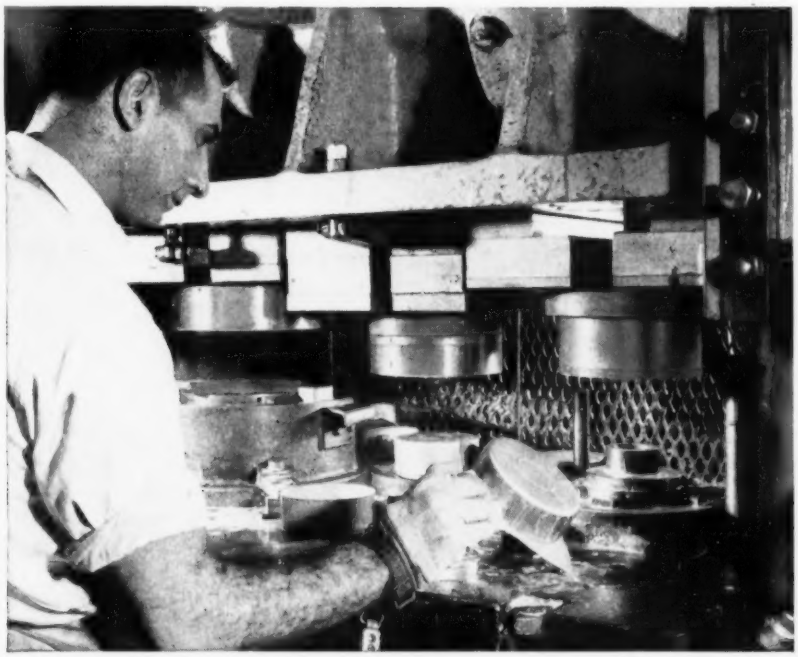
Tool Steel Topics

BETHLEHEM STEEL

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

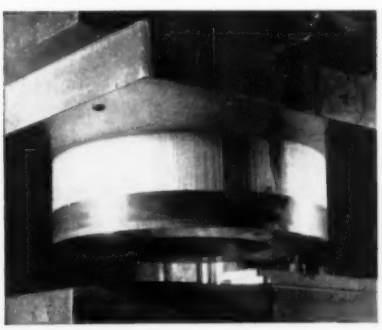
Export Distributor: Bethlehem Steel Export Corporation



Good Results with BTR Hollow-Bar in Manufacture of Fan Housing

Based upon all-around performance — less time spent in machining, good resistance to wear, and ease of heat-treatment — dies of BTR (Bethlehem Tool Room) Hollow-Bar rang the bell recently at Electrolux Corp., Old Greenwich, Conn.: the steel was supplied by Lindquist Steels, Inc., Bridgeport, Conn.

The dies, hardened to approximately Rockwell C 60, and operating in a 100-ton press, formed fan housings from 25-gage zinc-coated sheet steel at the rate of more than 1600 pieces per hour. Redressing was required once every two months or so, and then no more than 0.010 in. was removed.



BTR Hollow-Bar is made from our oil-hardening tool steel by a process called high-speed trepanning. By this method, we take hammer-forged round bars, core the inside diameter, then give them a rough-turning on the outside.

With BTR Hollow-Bar there's no need to run up shop costs waiting for delivery of forged rings or discs. Instead, this fine tool steel comes to you ready to go, with no need for drilling, rough-boring, rough-facing or rough-turning.

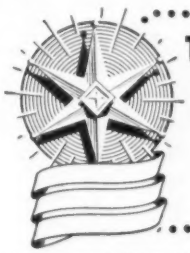
Your Bethlehem tool-steel distributor will be glad to explain how BTR Hollow-Bar can be of real service to you. Or a phone call or letter to the nearest Bethlehem sales office will bring you detailed information promptly.

BETHLEHEM TOOL STEEL ENGINEER SAYS:

Remove all the "Bark" from Liquid-Quenched Tools

Most users of tool steel realize that it is necessary to remove the "bark" (scaled and decarburized outer surface) from tool-steel bars in order to obtain full, uniform hardness in heat-treatment. If this area is not removed, low hardness will result because of the low carbon content of the decarburized metal. It is not always recognized that this procedure is necessary on tools which are to be liquid quenched, even though portions of the tool do not constitute working surfaces.

If tools are to be liquid quenched, all the bark must be removed to avoid excessively high quenching stresses which could cause cracking of tools during hardening. Low carbon areas on the surface transform during hardening at a different time than the higher carbon interior. This sets up additional stress which, added to the high thermal stresses from quenching, could cause cracking. Air-hardened tools can tolerate bark on non-working areas because of the low hardening stresses in air hardening. But with liquid-quenched tools there are no exceptions — remove all the bark.



TOOL STEEL MOVIE WINS ANOTHER AWARD

"Teamwork," Bethlehem's new motion picture on tool steel, received a second film award, a silver reel symbolic of excellence, at the recent American Film Assembly competition in Chicago.

The 16-mm, 30-minute color film explains the manufacture, quality control and heat-treatment of Bethlehem tool steels. It is available for showings to machinists, heat-treaters, die makers and tool manufacturers. To see the film, write to Publications Department, Bethlehem Steel Company, Bethlehem, Pa.

DIGEST OF THE WEEK IN METALWORKING

Jan. 17, 1957—Vol. 179, No. 3

The IRON AGE

Digest of the Week in Metalworking

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Address mail to The IRON AGE
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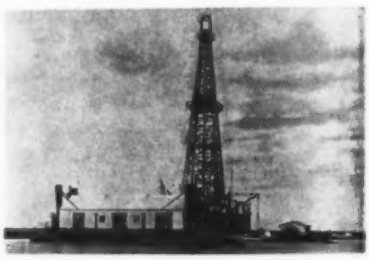
NEWS DEVELOPMENTS

HOW FAST-TAX VETO AFFECTS STEEL'S PLANS P. 31

Turn-down of fast-tax applications has not altered steel's expansion plans drastically. Most announced programs will go ahead. What steel really needs is a realistic program of tax amortization. Granting of fast-tax aid would not have solved problem.

CAN STEEL MEET PETROLEUM'S NEW DEMANDS? P. 38

Oil country goods are already tight. But petroleum industry's demand for



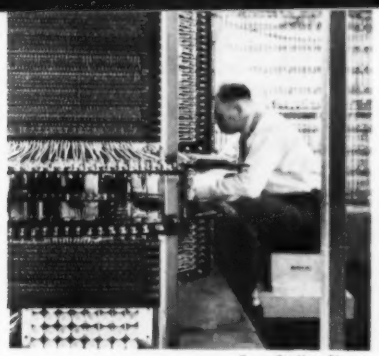
tubular products may double by 1965. Drilling activity will increase, and well depth will also climb.

ROADBUILDING PROGRAM PICKS UP SPEED P. 34

The much balleyhooed federal roadbuilding program is collecting a large number of critics, most of whom ask, "Where are the roads?" Senator Gore, of Tennessee is looking for answers.

WHAT'S IN THE NEW FEDERAL BUDGET P. 35

Military and foreign aid are responsible for most of $3 billion rise in budget requests. Tight money policy apparently will continue despite protests from many quarters.



Ezra Stoller Photo

◀

COMPUTERS have only scratched the surface in metalworking. Problems that until recently were believed impossible to solve, can now be run off with the speed of light. Equipment such as the IBM computer shown at left, is at industry's disposal. Technical Editor John Obrzut tells (on P. 71) what computers can do for you.

A NEW WAGE SPIRAL IS IN THE MAKING P. 53

Ike wants Congress to apply the $1-per-hour minimum wage law to everybody, not just certain groups, as is the case now. If Congress okays the measure, as seems likely, unions will seek higher wages to preserve customary wage differentials. And we will be spiraling again.

FEATURE ARTICLES

HOW HEAT AND TIME AFFECT WELDING P. 75

When the arc from a welding torch hits a piece of metal, things start happening that you might be unaware of. Temperatures at the weld zone can jump to 2500° and higher. Crystalline structure of the steel changes. Tensile strength and other mechanical properties may be altered. Here are some tips on how to predict and compensate for these changes.

MAGNESIUM SWINGS MORE WEIGHT IN TRUCKING P. 78

In the days ahead you will be seeing more trucks on the highway having bodies of magnesium. At least 25 firms are now building them. Some of the advantages: lighter weight, higher payload, single-shell construction eliminates framework and lowers assembly costs.

PLASTICS CURB CORROSION IN METAL PROCESSING P. 80

Especially in nonferrous refining operations and electroplating, synthetic resins are proving the most effective and economical corrosion inhibitors. Although no single plastic yet developed can solve all corrosive problems, a number are capable of withstanding several kinds of highly corrosive service. This article may serve as a guide for your operation.

COMPLEX HEAT PATTERNS FLAME-HARDEN PARTS P. 83

The job of flame-hardening a hyperbolic shaped roller can be tricky. National Cylinder Gas Co. solves one such problem by using two torches; spinning the part while one end heats at a time. NCG engineers had to take into consideration the composition of the steel and the pattern formed by the burners.

CAN SEALERS FILL YOUR FABRICATING NEEDS? P. 84

They probably can, if you are making sheet metal products. Whether you want to stop passage of air, dust, liquids, heat or solve any of a hundred other fabricating problems this versatile material may be the answer. Here's a rundown on sealers: what they are, where they're used and how. Check them against your production needs.

MARKETS AND PRICES

COMPANY CARS: SHOULD YOU LEASE OR BUY? P. 36

Large fleet owners particularly, are finding advantages in auto leasing arrangements. In these days of tight money, substantial amounts can be freed for more productive uses. And it protects companies from used car market fluctuations.

WHY DETROIT DRAGS ITS PURCHASING HEELS P. 37

It's no real mystery why automobiles aren't so active in the steel market. Some makes just aren't selling as expected. There's no pressure to build inventories, which were carried over in good condition from 1956. Dealers are making good profits.

IS BAR MARKET RELIABLE ECONOMIC BAROMETER? P. 40

Shipments of cold finished bar, long felt to reflect business activity, were slow in coming back after the steel strike. Producers are optimistic, however, with increasing inquiries and more ordering activity.

HOW FORD'S THUNDERBIRD SCORES ON ROAD TEST P. 48

Departing from his usual process- and production-type column, Detroit Editor Tom Carry tells of a test hop he made in a 1957 Ford "T-Bird." Among other things, he felt a sense of security while speeding down the highway at 90 mph.

WHAT'S CAUSING AUTOMOTIVE STEEL LETDOWN? P. 107

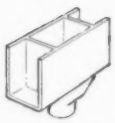
Combination of poor sales in medium priced cars and strict inventory measures are behind easing in cold-rolled sheet market. Auto plants are running on tightest possible inventories. Tight money also a factor.

NEXT WEEK:

BARGE TRAFFIC GROWS ON INLAND WATERWAYS

Barge builders have fat backlogs of business. Inland waterways teem with traffic. Why the increased activity? Next week's Special Report analyzes what's happening on our canals and rivers in industrial shipping.

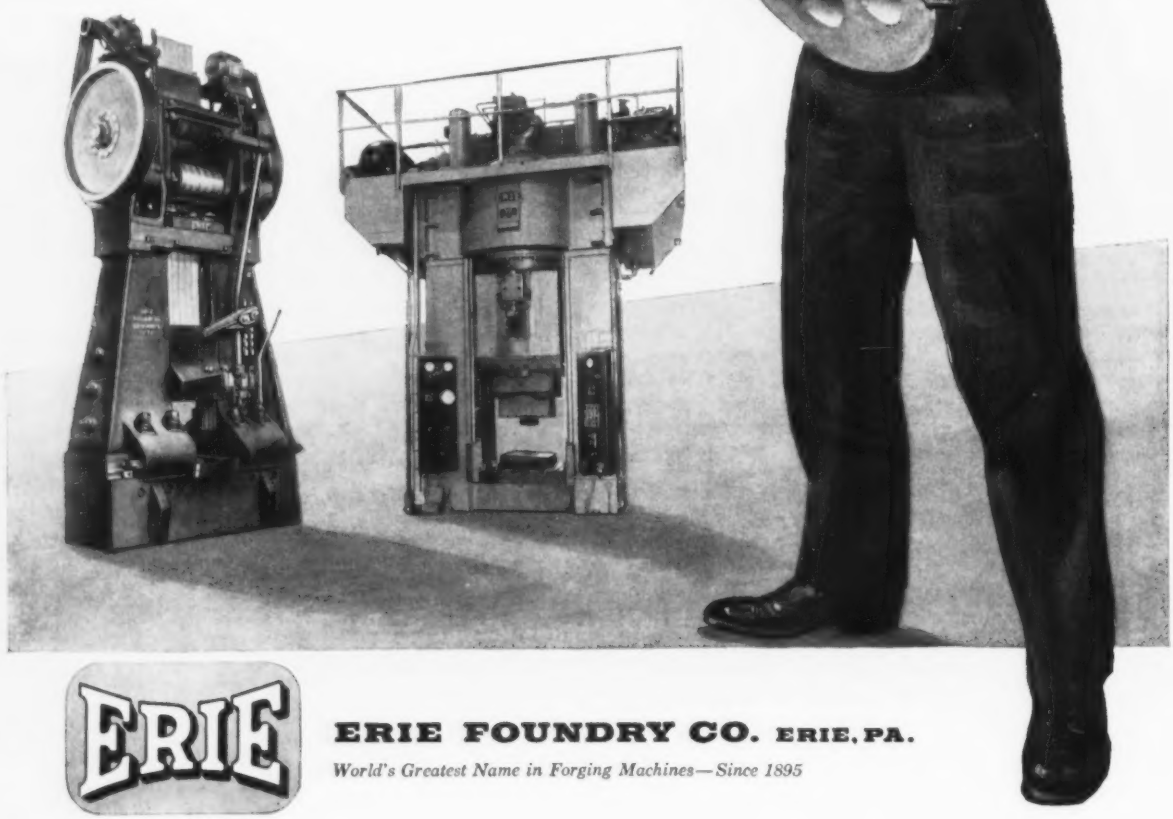
Hammer or Press..... which is best for your forged product?



Hammers forge some pieces more efficiently than presses; presses work some forgings better than hammers. What is a forging man to do? Easy! Talk with the firm that makes the best in both hammers and presses . . . talk with Erie Foundry Company. We will help you with expert specific advice on the right machine for your forging requirements.

In one instance, Eaton Manufacturing Company's (Marion, Ohio) forge plant decided on this Erie 10,000-lb. Board Drop Hammer to forge 68-lb net flat-back ring gears, 16″ in diameter—in a single impression die, straight down, without blocking or pancaking. And, in another instance, Kaiser Aluminum's (Erie, Pa.) forge plant decided to use this Erie Foundry Hydraulic Forging Press with electromagnetic controls, to produce in quantity, their no-draft forgings.

Which is best for you—hammer or press? Talk to the recognized leader . . . Erie Foundry Co. Just call or write.



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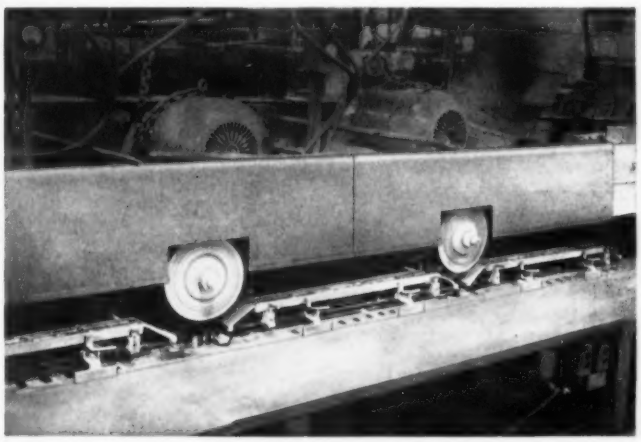
Osborn power-brushing has proven the ideal production method for removing draw marks, blending imperfections as an essential preliminary step, before buffing.

These outstanding results are another reason why Osborn power brushing has gained industry's confidence. An **O**sborn **B**rushing **A**nalysis, made at no obligation, will show how *you* can benefit from this advanced finishing method. Write *The Osborn Manufacturing Company, Dept. F-51, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

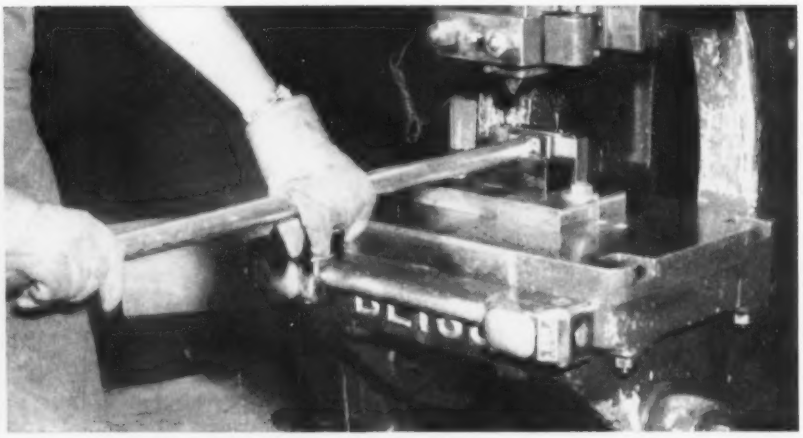


Osborn Brushes

Make More Durable Tubular Products at Less Cost

with Special Coated Armco Steel Tubing

TV mast joints are fabricated at the Armco Tubing mill. Note that expanding and dimpling didn't break the tight zinc coating on ZINCGRIP steel tubing in the sample joint.



Tailpipes formed from Armco ALUMINIZED STEEL Type 1 Tubing resist heat and corrosive gases much longer than their carbon steel counterparts.

All special Armco Coated Tubing grades are delivered to you with unbroken protection against rust. Their tightly-adhering zinc or aluminum coatings stay intact through fabricating operations. This way you save the time and expense of painting, dipping, or other protective treatments after fabrication.

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BPA NBP

EDITORIAL

The Bethlehem-Youngstown Merger

◆ THE BATTLE LINES have been drawn. The biggest merger attempt of the century will go to the Supreme Court. It will decide whether or not a union between Bethlehem and Youngstown Sheet & Tube would stifle competition in the steel industry.

That's as it should be. There is serious doubt in some people's minds that such a union would reduce competition. They feel that it would stir up the competitive areas in steel.

There are others who look with fear upon such a merger. They believe that we are headed towards too much concentration in American industry. So it goes throughout the metalworking world. Interest runs high over this battle.

But there is a side effect of this fight that should be dear to the hearts of all of us. Both companies could have supinely capitulated to the "opinion" of the Dept. of Justice that such a union would be illegal. But they didn't.

We have in our midst these days a certain indefinable feeling which at times borders on industrial cowardice. We fear to raise our voices. We fear to fight to the bitter end for what we think is right, just and proper. Good ideas have been dropped because of the implied threat of government action.

That is not going to happen in this steel merger move. It can't, for a simple reason. Mr. Eugene G. Grace, Bethlehem's board-chairman, is a fighter from away back. If it is the last big and important thing he does in that lusty life of his, it will be to use the Supreme Court as the founders of our nation intended it to be used.

Regardless of the final outcome of this case, it has done and will do much for business morale. It may put to an end the feeling that government is a master to be obeyed blindly without even a whimper of protest or question.

Government is people. Business is people. To be afraid of oneself is silly. The Supreme Court should decide epoch-making decisions. It never was intended that the hand of the opinion-maker in power aided by "previews" or snap judgments should rule industry. Not yet anyway.

Tom Campbell

EDITOR-IN-CHIEF

Keep Work Moving ***FAST!***

The Series "600" 'Load Lifter' Electric Hoist speeds production — lifts ½-ton loads at 30 FPM at the push of a button. Safe 24-volt push-button control starts this fast hoisting instantly. Two powerful, independently operating brakes are provided for extra safety. Each alone can hold the full load.

The "600" 'Load Lifter' is ruggedly built to meet industry's need for long-term hoisting economy and freedom from costly maintenance. Servicing is easy and safe in the air. No need to take the hoist down. Power and operating costs are low because the "600" mechanism is simple and frictional losses are minimized.

If you want lug or hook suspension, plain trolley or motor-driven trolley — you can have the "600" 'Load Lifter' to fit the need. Also available are current collectors, conductor cord trolleys and other devices to give you efficient, money-saving hoisting equipment from a single source. Capacities ½ and 1 ton. *Ask your "Shaw-Box" Distributor for complete details or write us for Bulletin 408.*

Series "600" 'Load Lifter' Electric Hoist with motor-driven trolley. Trolley available separately for hoists already in service. Installation takes only two hours with common tools.

'Load Lifter' Jib Cranes. Self-supporting. Full revolving. Swing easily on ball bearings. No binding. A hoist on this crane can serve a 550 sq. ft. area. Capacities to 5 tons.

Cord Reels to keep the hoist conductor cord taut and up out of the way of work and worker. Also useful for small cranes and other devices with motors up to 1 HP.

57 F-1

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SHAW-BOX CRANE & HOIST DIVISION

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dear editor: *letters from readers*

Ten Commandments

Sir:

We wish to take this opportunity to compliment you on the excellent editorial "Businessman's Ten Commandments," in your Jan. 3 issue.

We publish monthly the Dunlee Digest, which reaches all manufacturers and distributors of x-ray equipment throughout the world, and would like your permission to reprint this editorial. *R. L. Hendee, Dunlee Corp., Chicago.*

Permission granted.—Ed.

Selling Arm

Sir:

As you can probably imagine, I don't entirely agree with all of the conclusions in the article, "Are Warehouses Steel's Top Customer?" (Nov. 29). But nevertheless, it is an excellent presentation of a portion of our problems.

I do have one comment, however. We do not consider ourselves customers of the steel mills. We in effect are merely an extension of the steel industry's selling organization. We look on a customer as a consumer and, of course, a steel warehouse does not consume steel. One of the problems we have with the steel mills is the fact that they occasionally treat us as a customer.

Watch Customer Sales

When selling to a warehouse, we believe the steel mills should watch our sales to our customers rather than their sales to us for there is quite a difference. This is one of the reasons for the big increase in the number of warehouses outlined in your article. In a year like 1954 when the warehouses were full of steel and they cut back their buying, the mills had a tendency to look around for more warehouses to sell. This just results in even bigger inventories in relation to individual markets and a chaotic condition results.

In no way do I mean that only warehouses in business today should be sold in the future, but we like to encourage the mills to study the entire problem of distribution of steel before adding new outlets to the industry. *R. G. Welch, Exec. Sec'y., American Steel Warehouse Assoc., Inc., Cleveland.*

Executive Pay

Sir:

Please send the writer 2 copies of your excellent article "How to Figure Executive Pay," which appeared in the Dec. 13, issue. *C. S. White, Design Engineer, The Standard Electric Time Co., Springfield 2, Mass.*

Clear and Concise

Sir:

Please furnish me with a reprint of the very fine article appearing in the Oct. 25 issue, "Save by Knowing Drawing Lubricant Ingredients." This is certainly the clearest and the most concise article of this nature I have yet seen. *J. E. Dalton, St. Clair Shores, Mich.*

"Before beginning my speech I have something important to say . . ."

Somers
UNIGRAIN®
thin strip brass
for
deep drawing

Uniform fine grain size of Somers eyelet brass—less than .010 mm. (75X).

with
Fine Grain Finish

Somers Brass Company is pleased to announce the availability of a new, unique annealing process which makes possible a uniform fine grain of less than .010 mm. which can be drawn to full 40% elongation.

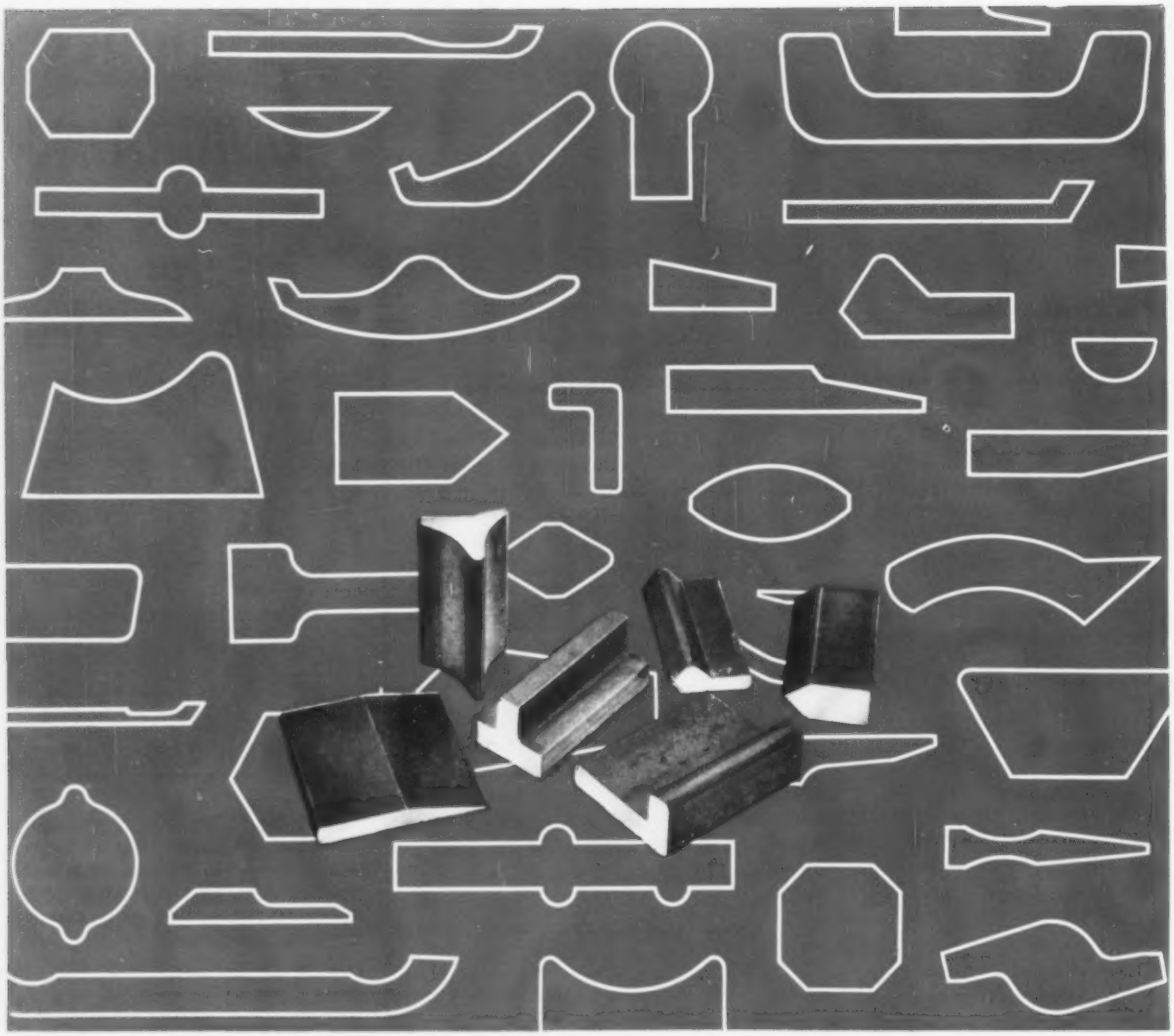
Developed in cooperation with the Selas Corp. of America this new process makes it possible to deep draw Somers THIN STRIP and still obtain a fine grain which is easily buffed to a brilliant finish.

And this new Selas Furnace provides high production as well as close control of temper and uniformity. It is typical of the modern equipment with which Somers produces copper, brass and other alloys to rigid specifications between .010" and .00075".

If you have a problem with thin strip, let Somers experience help you. Write for confidential data blank or field engineer.

FOR EXACTING STANDARDS ONLY
MONEL • NICKEL • COPPER • ALLOYS
THIN STRIP

Somers Brass Company, Inc.
WATERBURY, CONN.



Crucible special shapes

for better alloy steel parts at lower cost . . .

If you're machining intricate sections from solid bars—or using expensive forgings—stop! Choose instead, a *Crucible special shape* that approximates the finished part. *Crucible special shapes* eliminate rough-machining operations . . . reduce scrap losses.

There's practically no limit to the *special shapes* available at Crucible, in a wide variety of alloy steels. Rolls for over 400 special shapes are available—other shapes can be rolled to your specifications. Your local Crucible representative can give you the whole story of how *special shapes* can cut costs—save time. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

fatigue cracks

The Old Brain Still Counts

We were more than a little upset when we heard the editors had cooked up a roundup article on computers for this week (p. 71).

Our concern was not entirely unselfish. We've heard so much about electronic ''b r a i n s'' we thought one might be used to write this column some day.

A quick look at the article relieved our mind (?). The editors go out of their way to point out computers are no substitute for good old human brainpower. Not only that but they also clear up some of the confusion about their use—and tells where they can and do fit into metalworking.

Not having to worry about computers, we also decided to check the rumor that a 7-year old girl was going to take over the column after school. To this we couldn't get a definite answer. So—rather than take any chances we decided to follow the advice of one of our favorite mottos:

DO IT TOMORROW YOU'VE MADE ENOUGH MISTAKES TODAY

"Engineeringeese"

A bold stroke in favor of clear technical writing has been taken by Minneapolis-Honeywell. In a new booklet, "Why Not Just Tell Them", the company gives down-to-earth tips on how to sharpen and polish technical copy.

Put out by the technical writers of M-H's Industrial Div., in Philadelphia, it gives helpful hints to all who have to put down engineering thoughts on paper.

Here are some amusing examples of what the booklet calls "overstuffed sentences":

1. *The switch is used to initiate or terminate the pumping action.*

Changed to: *The switch starts or stops the pump.*

2. *The method permits operating economies in the amount of horsepower used to fulfill the demand.*

Changed to: *This method requires less horsepower.*

3. *The machine has a tendency to develop excessive and unpleasant audial symptoms when operating at elevated temperatures.*

Changed to: *The machine tends to get noisy when it runs hot.*

4. *The situation here dictates the utilization of . . .*

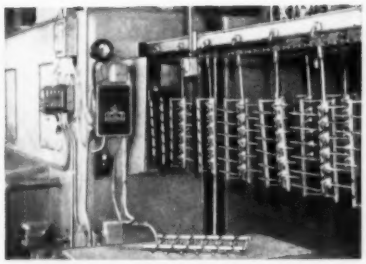
Changed to: *Here you must use . . .*

5. *Consideration had to be given to the factor of available fresh water supply.*

Changed to: *They had to make sure there was fresh water available.*

Puzzlers

How does this sound? Jim Mull says "I know the second man is purple because he lied when he said that the first man said he was purple. If the first man had been green he would have so stated. If the first man had been purple he would have claimed to be some other color. Therefore, the first man could not have replied that he was purple. The third man stated the second man is purple and we know that is true. Therefore, the third man is green." Winners: C. W. McKinley, Flint, Mich.; Sandra Goldberg, Bernard Relin Associated; W. C. Cook, Nobors Co; Mansfield, La.; F. K. Thomson, Kaiser Aluminum & Chemical Corp; Paul Taudle; J. Brugman, Rheem Mfg. Co, Downey, Calif; and D. M. Ertner, Western Electric, Omaha, Nebraska; Reuben Roseman, The Glidden Co, Baltimore, Md; Maj. Gen. Julius Klein; and W. W. Bell, The Lummus Co.



Cincinnati
Owners Report

- "processes 8 tons of parts daily"
- "120% more production"
- "tremendous time and labor saver . . . time saved, 75%; labor saved, 81%"
- "cleans and finishes 1000 parts per hour in 16' x 40' floor space"

What do your part cleaning and painting operations cost?

too much? normal? don't know?

Let a Cincinnati Cleaning engineer survey your requirements, give you a no-obligation report which may point to important savings. For cleaning, or for completely integrated painting systems, you can depend on CINCINNATI.

Write for FREE Information!

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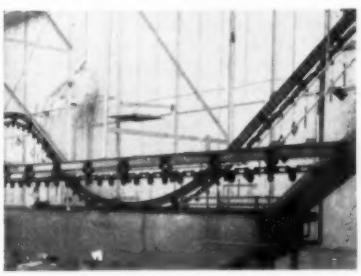
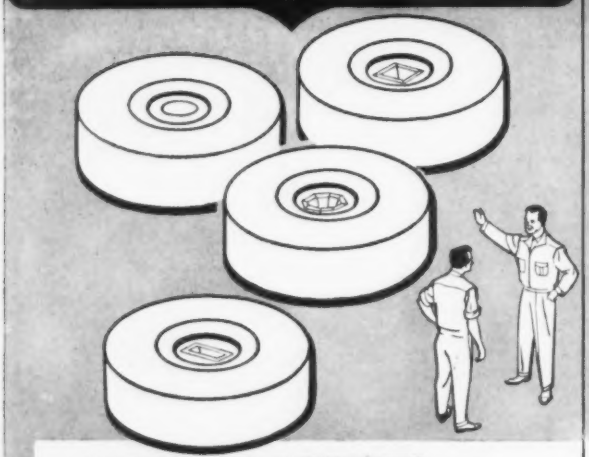
CLEANING AND FINISHING MACHINERY COMPANY, INC.
2017 Hageman Street, Cincinnati 41, Ohio



A New and Better Chrome Carbide

CARMET Grade CA-815

FOR HOT EXTRUSION DIES



BETTER RESULTS

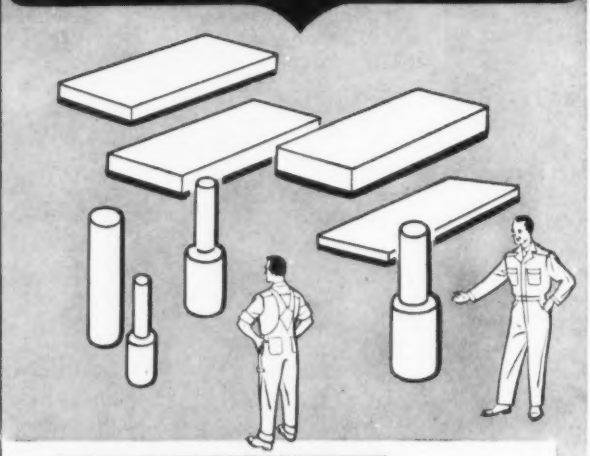
BETTER DIE LIFE
because of . . . High resistance to oxidation at elevated temperatures.

BETTER SIZE CONTROL
because of . . . Excellent wearability.

BETTER BAR FINISH
because of . . . High hot hardness.

LESS PICKUP AND GALLING
because of . . . Less affinity towards other metals.

FOR PRECISION GAGING



BETTER RESULTS

MORE ACCURATE GAGING
because of . . . Coefficient of expansion close to that of steel.

EXCELLENT SURFACE FINISH
because of . . . Low porosity.

EASY MAINTENANCE
because of . . . High resistance to corrosion.

LONGER GAGE LIFE
because of . . . Excellent wearability.

Write for the NEW
CARMET CATALOG

. . . Completely revised, the 16th Edition of the Carmet Catalog contains the latest information on all Carmet grades, and on Carmet blanks, tools, die sections, etc.; also gives details on special preforming and how to order special parts.

Address Dept. A-851

Now for the first time a completely homogeneous chrome carbide is available . . . Carmet CA-815. Grade CA-815 is ideally suited for such operations as the two illustrated above . . . or for *any* application where resistance to corrosion as well as resistance to abrasion are a factor.

Carmet CA-815 is manufactured under controlled conditions. Die and gage makers are assured of complete dimensional accuracy and excellent surface conditions. Only minimum amounts of stock are left for finishing.

For further information on this and other Carmet carbide grades, call your Carmet Engineer . . . or write *Allegheny Ludlum Steel Corporation, Carmet Division, Detroit 20, Mich.*

WSW 6155

For ALL your CARBIDE needs, call
Allegheny Ludlum

AL® FINE TOOL STEELS SINCE 1854

dates to remember

JANUARY

Compressed Gas Assn., Inc.—Annual meeting, Jan. 21-23, Waldorf-Astoria, New York. Society headquarters, 11 W. 42nd St., New York.

American Standards Assn. — Galliard seminar on industrial standardization, Jan. 21-25, Engineering Societies Bldg., New York. Society headquarters, 70 E. 45th St., New York.

American Institute of Electrical Engineers — Winter general meeting, Jan. 21-25, Hotels Statler and Sheraton McAlpin, New York. Society headquarters, 33 West 39th St., New York.

EXPOSITIONS

1957 Nuclear Congress — March 11-15, Philadelphia.

American Society for Metals—March 25-29, Los Angeles.

American Foundrymen's Society—May 6-10, Cincinnati.

American Boiler Manufacturers Assn., & Affiliated Industries—Mid-winter meeting, Jan. 22, Hotel Statler, Cleveland. Assn. headquarters, 1571 W. 117th St., Cleveland.

Assn. of Steel Distributors, Inc.—Annual convention, Jan. 22-26, Hotel Fontainebleau, Miami Beach, Fla. Assn. headquarters, 29 Broadway, New York.

Industrial Heating Equipment Assn., Inc.—Annual meeting, Jan. 28-29, The Shoreham Hotel, Washington. Assn. headquarters, 1145 19th St., N.W., Washington, D. C.

Cutting Tool Mfrs. Assn.—Annual meeting, Jan. 29, Detroit Yacht Club, Detroit. Assn. headquarters, 416 Penobscot Bldg., Detroit.

FEBRUARY

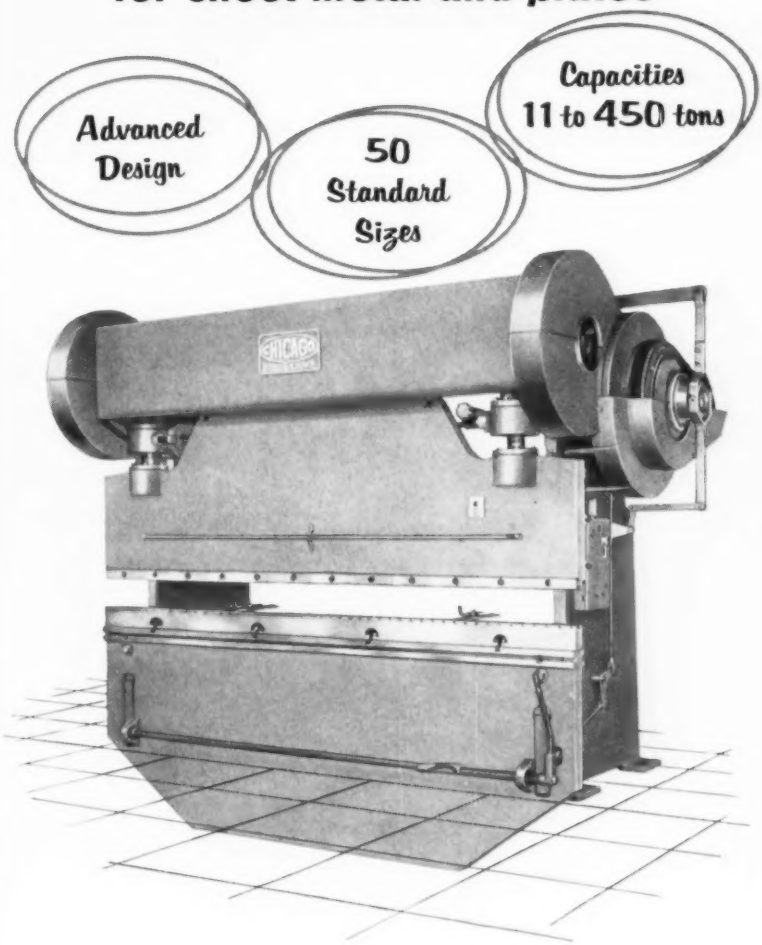
American Society for Testing Materials—Annual committee week and spring meeting, Feb. 4-8, Benjamin Franklin Hotel, Philadelphia. Society headquarters, 1916 Race St., Philadelphia.

Malleable Founders' Society—Technical and operating conference, Feb. 7-8, Wade Park Manor, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

The Institute of Surplus Dealers—Sixth annual trade show and convention, Feb. 16-19, New York. Society headquarters, 673 Broadway, New York.

CHICAGO® PRESS BRAKES

for sheet metal and plates



This is one of the Series D CHICAGO press brakes. It has a bending capacity of 10 feet by ¼ inch—150 tons. Over-all bending length is 12'-2".

Complete recommendations for any job on request.

6777

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Press Brakes • Straight-Side-Type Presses • Press Brake Dies
Hand and Power Bending Brakes • Special Metal-Forming Machines

DREIS & KRUMP MANUFACTURING CO.

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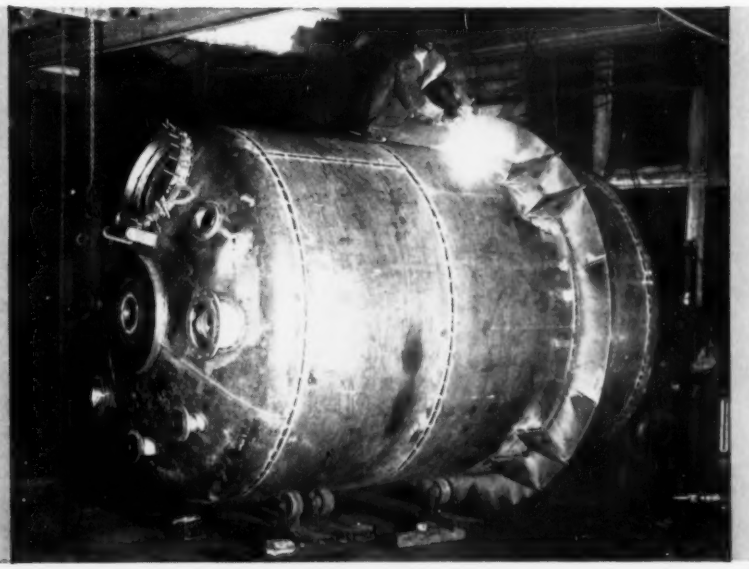
CF&I LECTRO-CLAD*...

AN INSIDE JOB—Welding on the inner, Lectro-Clad surface of a caustic evaporator. Regular manual arc welding with Inco "141" nickel electrodes preserves the continuity of the nickel plating. Prior to welding the nickel side, the plate edges are prepared by flame cutting and bevelling, welding is completed on the steel side, and the nickel is back chipped to sound steel weld metal.

reduces delivery time by one year

—New Jersey fabricator uses CF&I NICKEL PLATED STEEL PLATES for caustic evaporator



A welder at the L. Lawrence Company puts the finishing touches on an 8-foot diameter caustic evaporator. Heads and plates are all fabricated from CF&I Lectro-Clad, nickel plated on all inside surfaces for protection against contamination. Rolling, shearing and severe forming of Lectro-Clad are easily accomplished, using normal steel fabricating methods — the nickel plating *will not* check, spall or flake.

■ Instead of waiting a year for hard-to-get, expensive nickel, the L. Lawrence Company, Inc., of Newark, New Jersey used ⅜-inch steel plates with a .015-inch, Lectro-Clad nickel plating in making a caustic evaporator for a large chemical company. Results—a completely successful evaporator . . . *at lower cost . . . delivered a year sooner than expected . . . fabricated with standard procedures.*

The Lectro-Clad nickel plating on the inside surface of the evaporator does the same job as solid nickel or nickel-clad steel in protecting against discoloration and contamination . . . the carbon steel plates give structural strength and durability. What's more, you can expect plate delivery in six weeks when you order CF&I Lectro-Clad.

If you use, or fabricate, heavy industrial equipment where product contamination is a problem, you can probably use CF&I Lectro-Clad to good advantage. For further details, write for the Lectro-Clad Technical Manual, Wickwire Spencer Steel Division, The Colorado Fuel and Iron Corporation, P. O. Box 1951, Wilmington, Delaware. 4372

***NICKEL PLATED BY THE BART LECTRO-CLAD PROCESS**

Claymont Steel Products

CF&I

Products of Wickwire Spencer Steel Division • The Colorado Fuel and Iron Corporation

Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Casper • Chicago • Denver • Detroit • El Paso • Ft. Worth
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OTHER CLAYMONT PRODUCTS

Stainless-Clad Plates • Manhole Fittings and Covers • Large Diameter Welded Steel Pipe • Fabricated Steel Parts • Flanged and Dished Heads • Alloy Steel Plates • High Strength Low Alloy Steel Plates

. . . "*Positive Duplication—offered* ONLY *by* CINCINNATI (PD)° GRINDING WHEELS—*is a remarkable achievement in precision manufacturing and quality control!*"

And no wonder everybody's shouting the praises of CINCINNATI (PD) WHEELS. *You can save money . . . and increase your production . . .* when (PD) WHEELS are on the job. For through the CINCINNATI (PD) Manufacturing Process you are assured Positive Duplication of the original wheel *every* time you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

Yet CINCINNATI (PD) WHEELS are priced no higher than ordinary wheels.

For complete details, see your CINCINNATI (PD) Grinding Wheels distributor, or contact us direct. We'll be happy to send one of our representatives—men who know grinding and grinding machines as well as grinding wheels. Telephone (or wire or write) Sales Manager, Cincinnati Milling Products Division, Cincinnati 9, Ohio.

Remember—*only* CINCINNATI Grinding Wheels give you . . . (PD) POSITIVE DUPLICATION

CINCINNATI°
Grinding Wheels
A PRODUCTION-PROVED PRODUCT OF
THE CINCINNATI MILLING MACHINE CO.

°Trade Mark Reg. U. S. Pat. Off.

WE TAKE CARE OF ALL SIZES

Whether your ferro-alloy requirements be a barge load or drum, lump size or crushed, we are prepared to supply your needs.

Ohio Ferro-Alloys Corporation
Canton, Ohio

like handy service?

Then you'll appreciate the service at your nearby Crucible warehouse. There you'll find the widest selection of *special steels* — in the sizes, grades and shapes you need.

You'll feel at home because Crucible *is large enough to serve you — small enough to want to.*

Stocks maintained of:
Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting Die and Plastic Mold Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el, HY-Tuf, AISI Alloy . . . Onyx Spring, Hollow Drill Steel and other special purpose steels.

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Galvanized

ROEBLING is a specialist in galvanizing, with practically unmatched facilities for producing galvanized wire in enormous quantities and in complete size ranges. Hot galvanized is available in sizes from .283″ to .035″... Roegal (drawn galvanized) from .187″ to .005″.

And Roebling galvanized wire can be packaged in the way most convenient and economical for you... in coil diameters of 60″, 30″, 22″, 16″ and 8″...on reels, spools or handy spoolless cores.

You *pay* for the best when you buy galvanized wire. Make sure you *get* it—specify Roebling! John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

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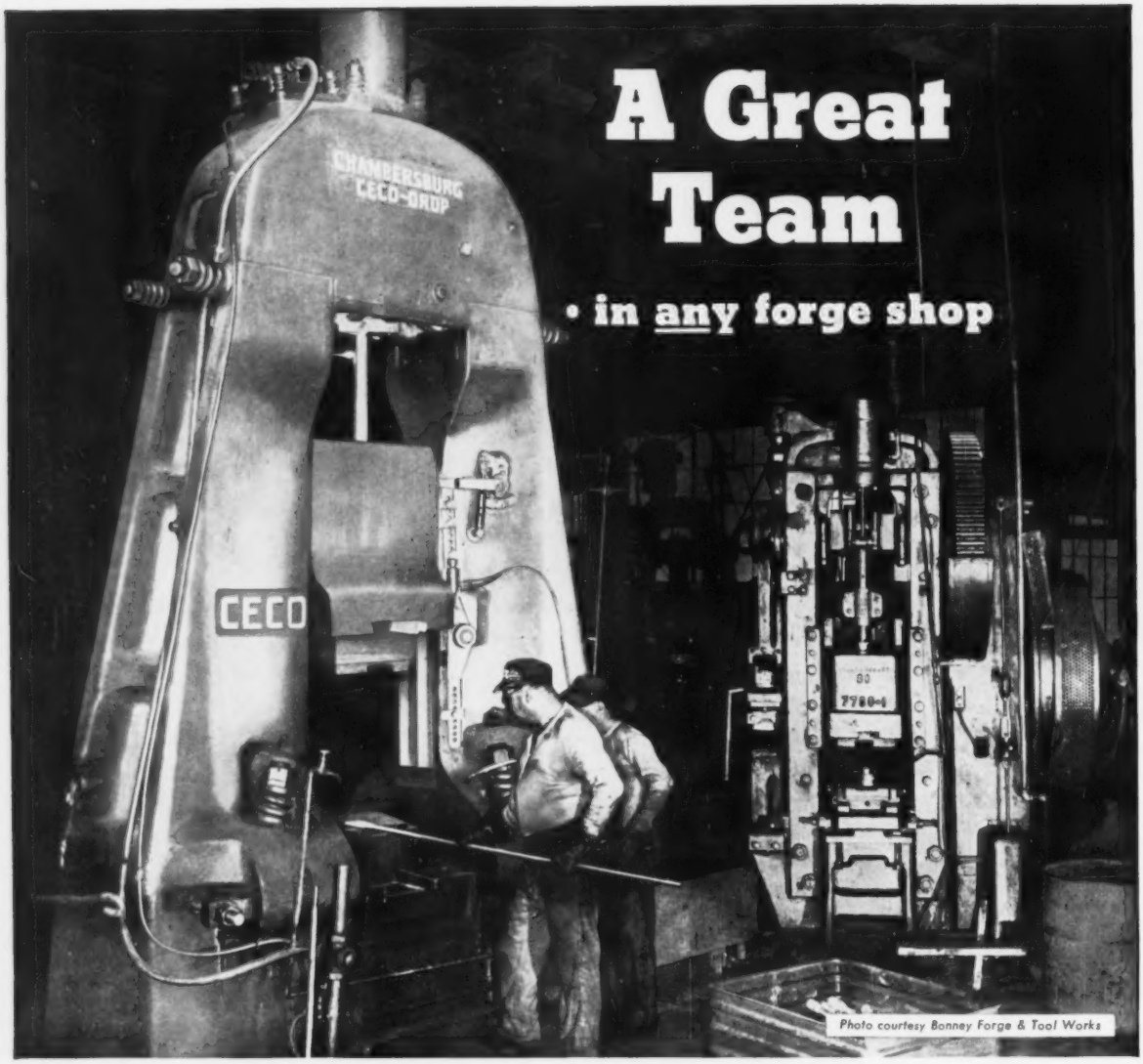
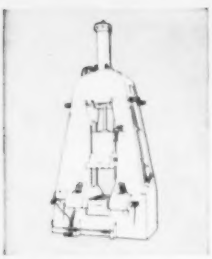
PHOTO BY MCBRIDE



A Great Team

• in any forge shop



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CECO-DROP

- Piston-lift • Gravity drop
- Costs less to operate
- Forges more minutes per hour
- Forgings made faster
- Operation is easier and safer
- Maintenance is cheaper
- Full stroke or short stroke without interruption
- Over 400 in service in over 100 forge shops

Ceco-Drop and Trimmer

• • *for top production*

When the chips are down, it is continuous, trouble-free, quality production that puts you ahead of competition. That fact explains why the Ceco-Drop (in combination with the "indestructible" Chambersburg Trimmer) has become in nine short years, the standard gravity drop hammer of the forging industry.

Write for descriptive Bulletins

CHAMBERSBURG ENGINEERING COMPANY
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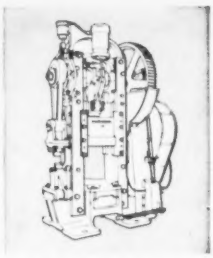


CHAMBERSBURG
FORGED STEEL SIDE TRIMMING PRESS

- Exceptional strength
- Jam-proof. Functions perfectly after stall-test
- Uses minimum floor space
- Accessible front and back
- Friction-slip Flywheel
- Interlocking forged steel side construction
- Low power consumption
- Safe
- Single or Double Crank

They cut your costs for four big reasons!

The complete Black & Decker line is POWER-BUILT to speed up your jobs!

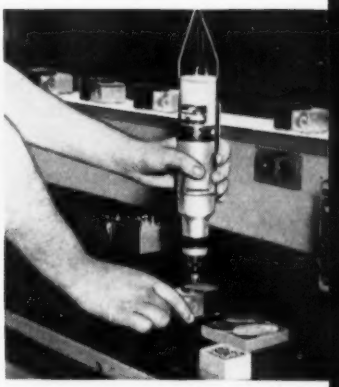
Whatever Black & Decker Tool you buy, *this* you can be sure of: (1) It will be powered by the best electric motor in the business. (2) Its balance, compactness and lightweight mean easier handling. (3) It will be versatile, driving many accessories from among the 1,000 *plus* Black & Decker offers. (4) Its rugged construction means less down time, lower maintenance.

Those are the reasons why B&D Tools help you save time, cut costs, take the hard work out of tough jobs. And why industry has made Black & Decker the world's largest builder of portable electric tools!

See your B&D Distributor for details—or write for Catalog No. 10 to: THE BLACK & DECKER MFG. CO., Dept. 7801, Towson 4, Md. (In Canada: 80-86 Fleet St., E., Toronto 2, Ont.)

Look Under "TOOLS-ELECTRIC" in 'Yellow Pages'

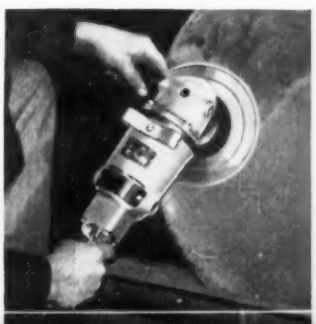
(1) TAILORED POWER — Heart of every tool is a motor completely built by Black & Decker and tailored to the tool's specific needs.



(2) STREAMLINED BALANCE —Like this Scrugun®, all B&D Tools are designed for easier handling, less operator fatigue.

(3) TOP VERSATILITY — Typically, this Sander does a variety of jobs... sanding, grinding, wire brushing, buffing, wood planing.

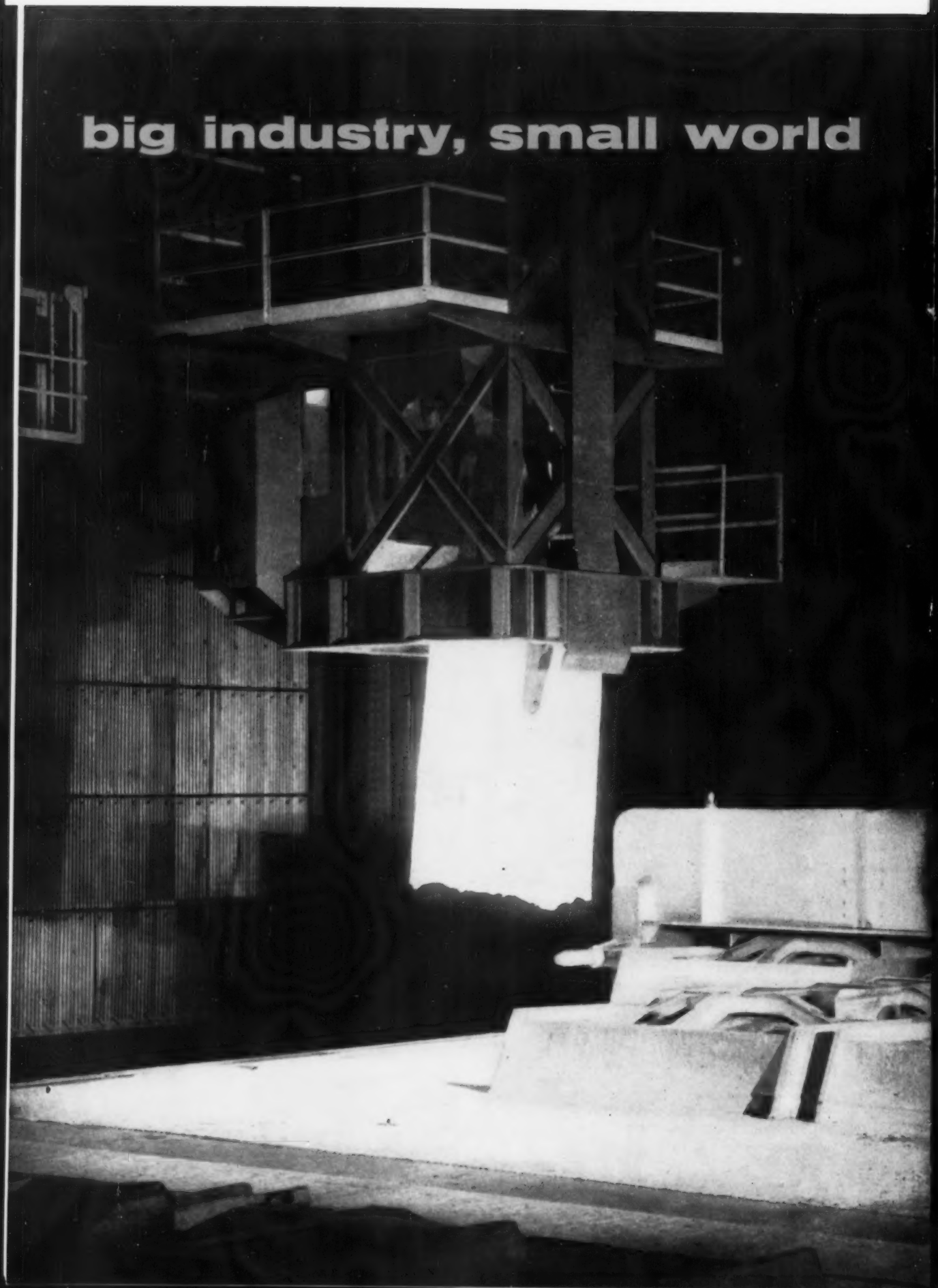
(4) EXTRA RUGGED—This B&D Hammer, for example, handles the toughest jobs imaginable because it's *power-built* to last.



LEADING DISTRIBUTORS EVERYWHERE SELL

B&D Black & Decker®

Portable electric tools . . . *power-built to last!*

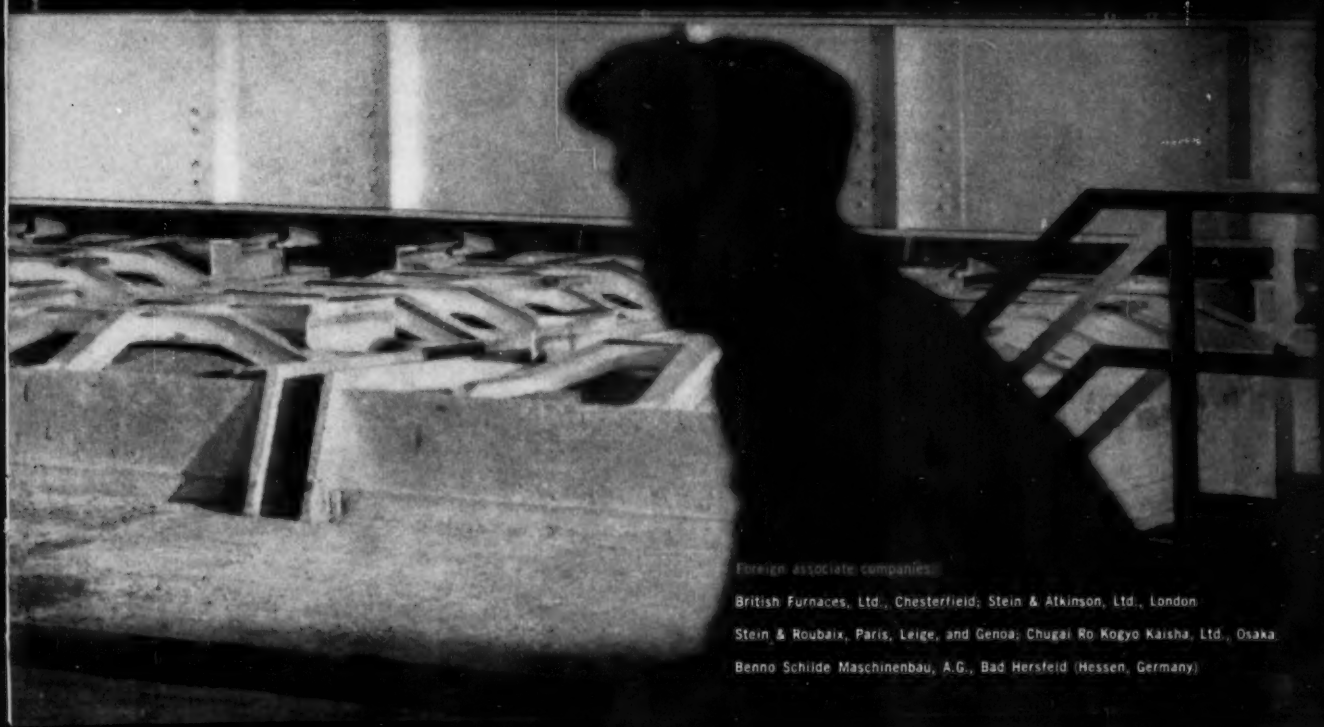

big industry, small world

annealing covers
billet reheating furnaces, continuous
carbon restoration and annealing furnaces, continuous
controlled atmosphere generators
high-speed stress relieving furnaces
one-way fired soaking pits
pit-type annealing furnaces
slab and billet heaters, continuous
strip annealing furnaces, continuous
strip galvanizing lines, continuous
wire patenting furnaces, continuous

Wherever this steel goes—from first soak to final shipping dock—it will find that the big steel industry is a small world as far as 'Surface' equipment is concerned. Somewhere along the line, whatever its destined shape, the steel will be made more workable and more useful in 'Surface' furnaces.

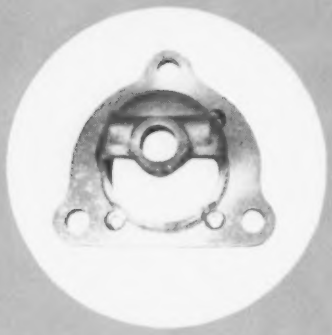
Why is it so easy to bump into 'Surface' in steel mills? One reason is that 'Surface' has literally grown up with the steel industry. A better reason is the confidence that steelmakers have in the performance of furnaces and generators manufactured by Surface Combustion Corp., Toledo 1, Ohio.

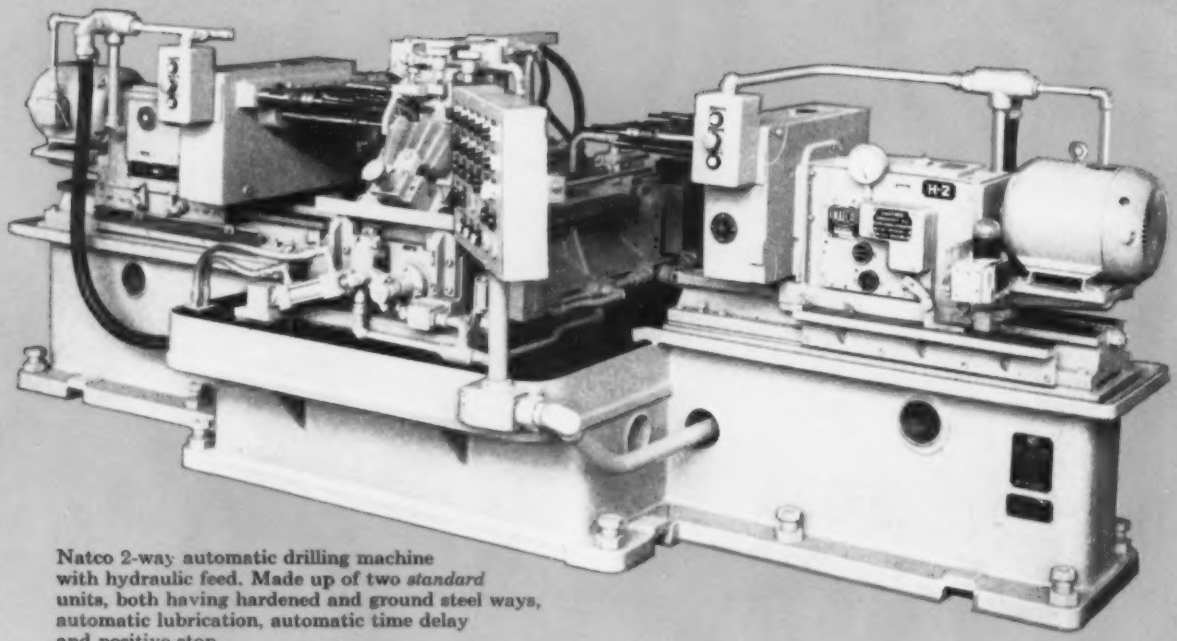
Surface
STEEL MILL FURNACES



Foreign associate companies:
British Furnaces, Ltd., Chesterfield; Stein & Atkinson, Ltd., London
Stein & Roubaix, Paris, Leige, and Genoa; Chugai Ro Kogyo Kaisha, Ltd., Osaka
Benno Schilde Maschinenbau, A.G., Bad Hersfeld (Hessen, Germany)

Natco Standard Units Perform Special Jobs

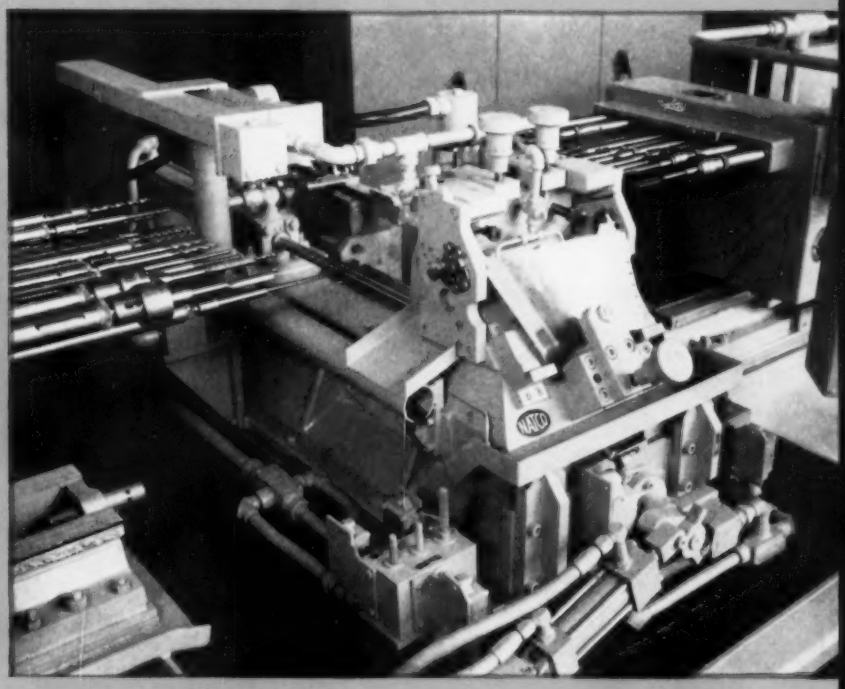




Natco 2-way automatic drilling machine with hydraulic feed. Made up of two *standard* units, both having hardened and ground steel ways, automatic lubrication, automatic time delay and positive stop.

Many *special* jobs can become routine with Natco's *standard* unit design. Take these parts, for instance. Unique parts presenting unique problems. Natco solved them by using *standard* horizontal, self-contained Holeunits with automatic fixtures. Varied operations are performed—production to meet customer's requirements.

Natco's use of *standard* units can mean quicker delivery and lower price to you. Call a Natco Field Engineer to determine whether Natco's *standard* unit design can solve your "special" problems.



Ask for information about the PAYD (Pay-As-You-Depreciate) Finance Plan.

NATIONAL AUTOMATIC TOOL COMPANY, INC.

Richmond, Indiana

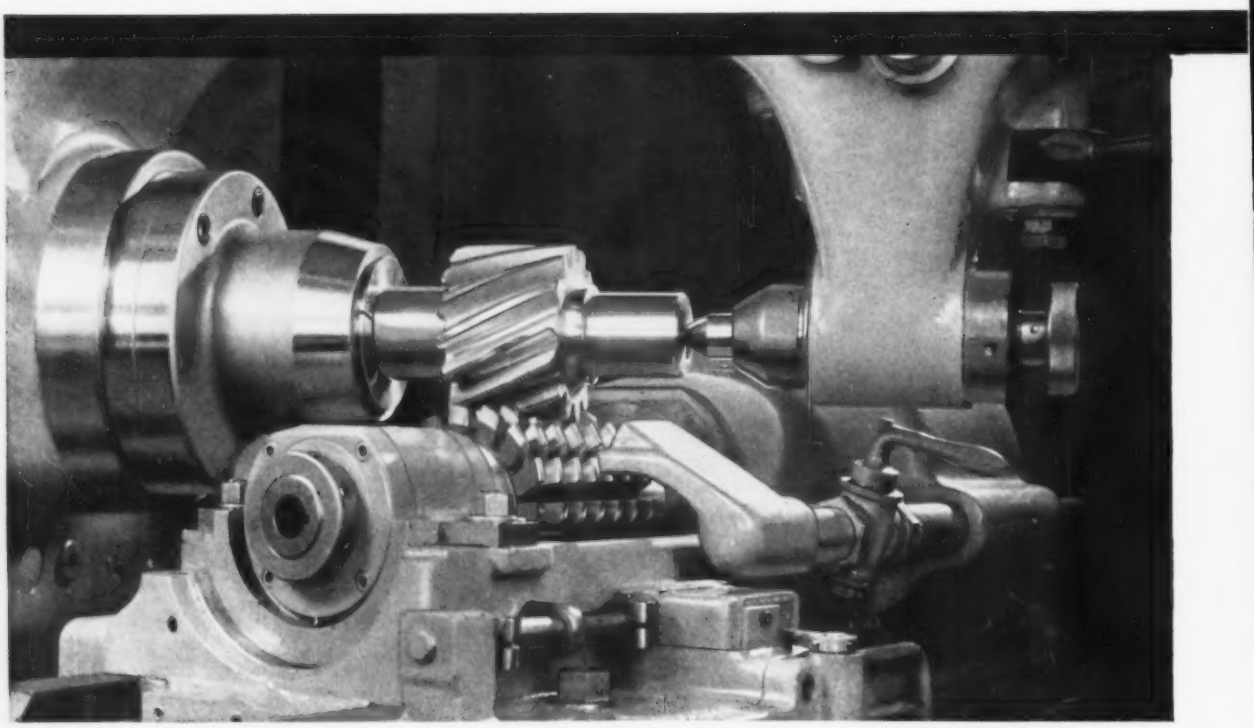
NATCO

Multiple-spindle drilling, boring, facing and tapping machines. Special machines for automatic production.

Call Natco offices in Chicago, Detroit, Buffalo, New York, Boston, Philadelphia, Cleveland and Los Angeles; distributors in other cities.

crown hobbing

saves time and cost in producing accurately crowned gears



Crown-hobbing on this special Barber-Colman No. 14-15 Hobbing Machine is an ideal production method of generating crowned gear teeth. Where gears are now hobbed and then crown-finished in a secondary operation, they may be crown-hobbed in one operation. When a hobbed finish is satisfactory, the shaving operation can be completely eliminated. If the degree of finish required calls for a further finishing operation, such gears may be finished after crown-hobbing at less cost and in less time because hobbing provides uniform stock removal.

Crown-hobbing also makes it possible to hold a change in tooth thickness within the desired limits, and the tooth bearing can be located at the most desirable point consistent with the job conditions.

In the operation shown here, 4 DP., 14T, 18° P.A. transmission gears with 2¾" face are crown-hobbed on a special Barber-Colman No. 14-15 Hobbing Machine. Teeth are hobbed with a change in tooth thickness of .0045". The automatic cycle includes rough hobbing R. to L. at a given depth, automatic lowering of the work slide against the crowning cam, climb hobbing L. to R. at a constantly changing depth, and rapid traversing out of cut. No further finishing is required in this particular case, and the gears are completed in one automatic operation, without changing tools or transfer to other machines. Savings on this part can be expected on the basis of the following comparison:

typical gear-crowning	crown-hobbing
Rough hob gear teeth.	Manually unload and load.
Transfer to other machine.	Automatic cycle — rough hob.
Semi-finish hob gear teeth.	R. to L., set to finish depth,
Transfer to next machine.	and crown hob L. to R.
Crown-finish gear teeth.	Manually unload and load.

The machine can be designed to suit your job requirements, either as a single-purpose machine, or as a universal machine for both crown and conventional hobbing. Parts can be hobbed in one or two cuts, depending upon specifications of the part. The cam can be designed to produce the tooth configuration required.

The machine required for crown-hobbing is provided with a cam mechanism for raising and lowering the work slide to produce a change in tooth thickness. The work slide is held against the rotary cam by hydraulic pressure in addition to its own weight. Change gears are provided in the cam drive so that different amounts of change in tooth thickness can be produced with the same cam.

Send us drawings of your crowned-gears. Our engineers will analyze the job conditions and make recommendations for crown-hobbing.

BARBER-COLMAN COMPANY

741 ROCK STREET • ROCKFORD, ILLINOIS

Hobs • Cutters • Reamers • Hobbing Machines • Hob Sharpening Machines

BARBER COLMAN

Rework your Monel ...it can give you years more pickling service

Look closely at this pickling crate separator pin.

See those go-nowhere threads and the weld beneath them? They tell a story. For years this piece of Monel* nickel-copper alloy has been used and re-used in pickling equipment. No one at Ingram-Richardson Manufacturing Co., Beaver Falls, Pa., can begin to tell all it has done.

But *this* they do know. Years ago they reworked the original piece. Made it and dozens of other Monel rods into separator pins. For at least 20 years, the metal has been in and out of the pickling bath.

Now look at the pin again. Sure, there are some signs of corrosion. But a nut on those Monel threads would *still* grip. And you can see the rod is sound as a dollar, good for many *more* years' service.

Wrought Monel alloy gives you important weight, safety, strength and design advantages in original equipment. After its original usefulness is dissipated, you can rework it and re-use it. Often several times.

Next time you order batch pickling fixtures, specify Monel nickel-copper alloy. In the meantime, get the newest Inco booklet, "Equipping the Pickle House." Write:

*Registered Trademark

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

INCO TRADE MARK NICKEL ALLOYS

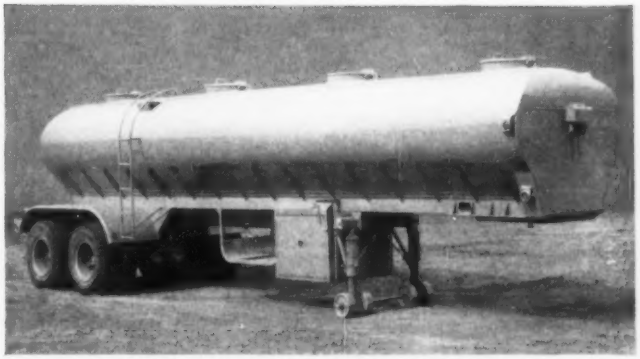
Monel . . . for proved pickling life

Yoloy "E" Makes Lighter Trailers

Yoloy "E" containing nickel, copper and chromium, a Member of the Yoloy Family of Steels, having a longer life, greater strength and good weldability makes Trailer tanks more durable and stronger. This new style tank is brought about by the use of lighter gauges plus the elimination of certain structures formerly required, plus reshaping and reforming the skin. The result is a tank that is serviceable, strong yet lighter.

Write for these free pamphlets in The Yoloy Family series:

Yoloy "E"	High Strength Low Alloy Steel-standard applications
Yoloy	High Strength Low Alloy Steel-special applications
Yoloy "S"	Higher Strength Steel for increased service life
Yoloy "C"	Corrosion Resistant Grade for deep forming
Yoloy Pipe	Continuous Weld for corrosion resistant applications



Independent Metal Products Div. of Fruehauf Trailer Co. produced (above) a new style 6250 gallon tank weighing approximately 1100 lbs. less than a 6000 gallon tank made of conventional steel and (right) a new style cement hauler saving as much as 300 lbs.

QUALITY YOUNGSTOWN SERVICE

THE Youngstown SHEET AND TUBE COMPANY

General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

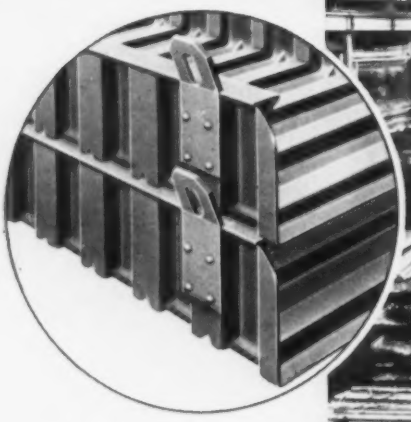
Producers of Quality Carbon and Alloy Steels for Over Half-a-Century

BEFORE AND AFTER PICTURES PROVE...

REPUBLIC BAR CARRIERS

BEFORE Republic Bar Carriers, materials were piled wherever space allowed. Handling operations were impeded. Inventory control was practically impossible.

AFTER Republic Bar Carriers were installed, materials could be handled quickly and easily. Valuable floor space was saved. Materials became easily accessible.



CARRIERS are equipped with crane-handling lugs which also permit stacking. Corrugated steel construction provides strength, assures long service life at lowest per-year-cost.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

save space, speed handling, make materials easily accessible

SAVE SPACE with Republic Steel Pallet Racks. They provide a practical, economical way to palletize and stack bulky, uneven, fragile materials. Tubular steel supports adjust every six inches to handle palletized material of any height. Two-way entry permits loading and unloading from either side. Select single pallets from any level without restacking. Send coupon for complete description, specifications and quotations.

Before Republic P-135 Bar Carriers went to work in this plant of a nationally known manufacturer*, materials of varying sizes and types were piled up just as they were received on shipment. To move a specific item to the production area required many handling operations. It was both costly and time-consuming.

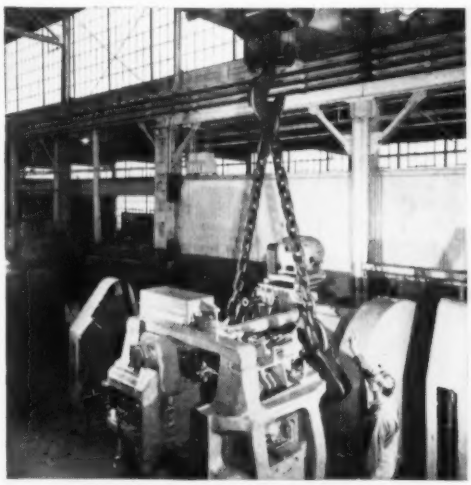
Then the company purchased and put to work a battery of Republic Bar Carriers. These units are ideally suited to handling groups of various size materials with lengths longer than the carrier.

Note in the "after" photo how materials are efficiently separated according to size and type. There's no inventory problem here now. Note, too, how tiering of the carriers saves space. Open-end construction permits easy accessibility to items at any spot in the tier—whether at top or bottom.

These units can also be used to advantage in handling pipe, tubing, angle irons, reinforcing rods, mouldings, extrusions, narrow-width sheets and plates, and many other materials characterized by narrow dimensions. Length, width and height of Republic Carriers can be designed to meet your specific requirements.

The Republic P-135 Bar Carrier may be the solution to your handling problem. Or you may require the design of a completely new unit. Our engineers will help you without obligation. Contact your Republic Materials Handling Representative for more information. Or mail the attached coupon.

**Name on request.*



SPEED HANDLING of heavy, bulky materials like machinery with Republic Chain Slings. They are made to your requirements in Alloy Steel, High Test Steel and Wrought Iron. All are proof tested and warranted to meet or exceed specifications. Because each grade of material has advantages over the other, depending upon application, we recommend talking over your requirements with a Republic Chain Engineer. Send coupon for more data.

REPUBLIC STEEL CORPORATION
Dept. C-2826
3104East 45th Street
Cleveland 27, Ohio

Send more information on:

☐ P-135 Bar Carriers ☐ Chain Slings ☐ Pallet Racks

☐ Have a Materials Handling Engineer call.

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

STEEL

and Steel Products

Why Allis-Chalmers Cooling Coil Design Means . . .

Better Rectifier Operation

More Efficient Heat Transfer results from internal cooling coil. The steel coil surrounds active parts, offering more cooling surface and better heat transfer than other types. Unit maintains more uniform temperature and mercury vapor pressure.

Simplified Maintenance results from Allis-Chalmers unique unit construction. All active components are attached to the anode plate for easy withdrawal, dismantling, and re-assembling — as illustrated above.

Positive Arc Barrier is formed by the cooling coil, which is insulated from the tank. The main arc is confined within the coil, preventing arc transfer to the tank.

Years of Operation in hundreds of installations have proved the reliability, ease of operation, and simplified maintenance of Allis-Chalmers mercury arc rectifiers. You can get complete information at your nearby A-C office, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

LIVE BETTER ELECTRICALLY

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

A-5084

NEWSFRONT

Can Appliance Peaks Be Ironed Out?

Appliance manufacturers are making progress toward smoothing out their production schedules. One major producer reports he's able to pretty well average-out refrigerator and washer production over the entire year. Demand for combination washer/dryers is smoothing heavy fall and winter peaks in dryer production. Special off-season discounts to distributors are helping move room air conditioners.

Roadbuilding: Rural Areas Lead

City dwellers aren't happy, but rural areas are getting faster service on road modernization. Big obstacle to faster urban progress is right-of-way buying. Property — even unoccupied property—is soaring in cost. And occupants living or working on much of the needed real estate just don't want to move.

Test Checks Core Sand Properties

Many casting defects stem from sand mold performance. To cut guesswork in sand-molding a newly-developed hot-strength test permits checking properties of molding and core sands under gradient-heating conditions. The method can reproduce—in the form of a compression test specimen—thermal conditions in the surrounding sand during solidification. Both alloy type and section size are considered.

Metal Lath: Saddling Up For S'West Market

Assembly line cement-plastering techniques — finding favor on several Southwestern housing projects—are boosting metal lath's share of the home construction market. Builders simply nail metal lath panels to studs. A truck-mounted, plaster spray gun then moves from house-to-house, spraying on a stucco-finish cement plaster. The method speeds inside walls as well.

Underdrive Press Cuts Building Cost

An underdrive press proved just the thing for a new two-story plant built on a hillside location. Fact that practically no extra digging had to be done for an underdrive mechanism basement pit meant the upper story ceiling could drop 15 ft. Crane runways, construction costs both came down. Another benefit: maintenance is safer (no high scaffolds), doesn't clutter up the floor.

Overcoats Speed Concrete Curing

A new cellulose insulation material is helping ease the problem of wintertime construction delays for concrete-curing. The blanket insulation, wrapped around the forms, conserves the heat developed within the freshly-poured concrete. Field tests show it's effective to zero-degrees. Cost's about half that of heated enclosures.

For A Power System, Computer Control

Fully-automatic computer control of a complex power generation installation is promised before year's end. Capable of weighing more than 2-million "bits" of stored information against system variables, the computer will regulate to give most efficient power generation.

Movies Made of Metal Fatigue

Detailed photos of the fatigue process in aluminum specimens under torsional stress are being made. A small fatigue testing machine equipped with a clock-controlled, 16 mm motion picture camera takes time-lapse pictures, automatically, through a metallurgical microscope. National Bureau of Standards built the machine.

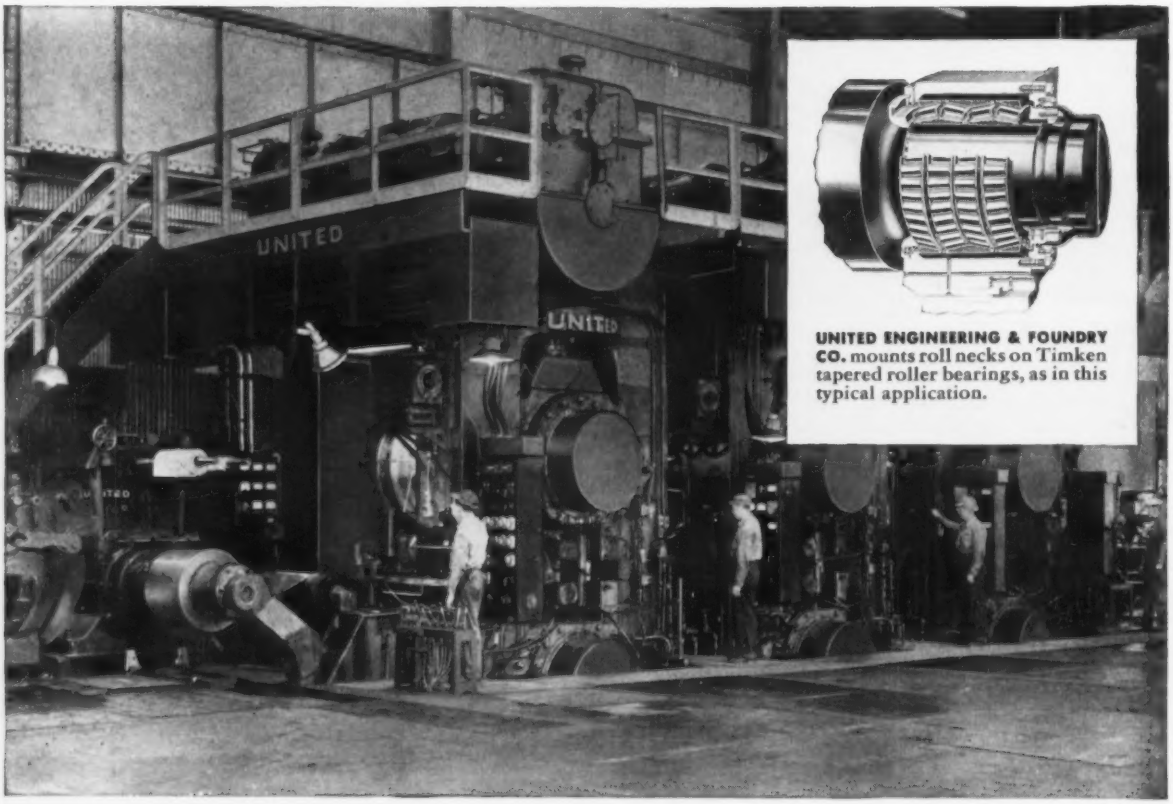
Will Aircraft Turn To Hafnium Carbide?

Hafnium carbide's likely to be a coming thing for extreme-temperature aircraft applications according to one British aeronautical expert. Immediate applications might include construction of turbine blades for turbojets, exit nozzles for ramjets and other engine hot spots. Another possibility: hypersonic airframes.

New, In-Line Transfer Machine

A new, in-line transfer machine has been built for boring and tapping automotive differential carrier and cap assemblies. The seven-station machine bores two carrier bearing holes, loosens and tightens four bearing cap bolts, semi-finishes two bearing surfaces and taps each bearing. Rate is 180 pieces per hour.

Crucible Steel gets lower bearing cost per ton...less scrap loss per coil with roll necks on TIMKEN® bearings



UNITED ENGINEERING & FOUNDRY CO. mounts roll necks on Timken tapered roller bearings, as in this typical application.

UNITED ENGINEERING built this 3-stand tandem cold mill for Crucible Steel. Back-up rolls and work rolls are mounted on Timken® tapered roller bearings. By holding rolls rigid, Timken bearings assure "on-gauge" operation, cut costly scrap loss. And the long life of Timken bearings keeps bearing cost per ton of steel rolled to a minimum.

Tapered construction lets Timken bearings take radial and thrust loads. No extra thrust devices are needed. Chuck mountings are simpler, more compact. Timken bearings hold shafts, housings concentric — make closures more effective, with less lubricant leakage. Grease-lubricated Timken bearings require no tubes, pipes or reservoirs, reduce lubrication system maintenance costs. And rolls can be changed faster.

Geometrically designed and precision-made to give true rolling motion, Timken bearings permit easier acceleration, easier driving, which means a saving on power, reduced skidding and scuffing between rolls. Maintenance and repair costs are cut. Mills using balanced proportion Timken bearings increase roll neck strength up to 60% — load ratings up to 40%. The balanced proportion design permits large diameter roll necks without increasing bearing O.D., provides maximum capacity in less space.

Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS ROLL THE LOAD

Steel Forges Ahead Without Fast-Tax

Most announced expansion plans will go through . . . Steel now looks for more realistic approach to amortization . . . Turndown brings new pressure for higher prices—By J. B. Delaney.

◆ THE GOVERNMENT'S veto of fast-tax writeoffs for steel expansion is just another skirmish in the industry's long-range battle for a more realistic tax depreciation policy.

To sum up industry opinion: Accelerated amortization would have been welcome, but it still wouldn't have solved the basic problem. What it needs is an amortization policy based on current cost of replacement.

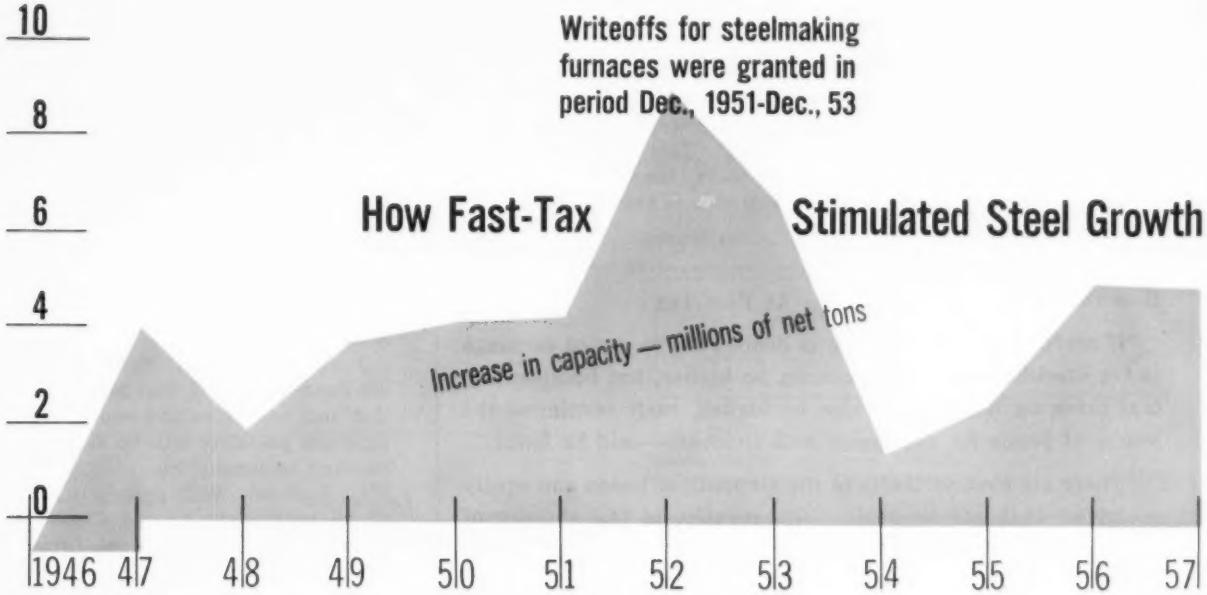
As to whether the fast-tax turndown on $2.3 billion in current and projected expansion will alter industry's plans, the answer is "yes." But not too drastically.

Be Realistic

Here's how W. B. Boyer, treasurer of Republic Steel Corp., looks at it:

"We have not been advocates of fast amortization as the answer to the problem. Although past projects have naturally been covered by it, we feel the real answer is present cost amortization. This permits industry to charge enough against current operations to provide for inflated costs on a realistic current basis, rather than historic precedent.

"Our expansion program will continue to be financed out of current profits, depreciation and amortization and a $75 million revolving bank credit."



Writeoffs for other facilities were granted as follows:

Blast furnaces	Dec., 1951-Dec., 1953
Iron ore	July, 1952-Dec., 1955
Coke by-products	Dec., 1951-Sept., 1955
Taconite iron ores	Dec., 1951-Dec., 1956
Wide flange structurals	June, 1953-Aug., 1955
Heavy steel plate	Aug., 1953-Dec., 1956

▪ A total of 11,436,129 tons of new ingot capacity was added to U. S. steelmaking capacity as a direct result of the fast writeoff certificates. Dollar value was $2.7 billion.

SPECIAL REPORT

What it boils down to is that steel's current wave of expansion was not based on the expectation that the five-year writeoff incentive would be revived. In fact, the numerous requests for accelerated amortization certificates (see tabulation) was a spontaneous development. The flurry followed Jones & Laughlin's request for a certificate covering its proposed $250 million Texas pipe mill.

The industry is really after something more basic. It's a battle that's been going on for quite a few years, and it involves other industry as well as steel.

Past Performance

Roger M. Blough, chairman of U. S. Steel Corp., makes no bones about the role that fast-tax privileges played in encouraging the mills to expand.

"It was this special legislation," says Mr. Blough, "which enabled the steel industry—among others—to perform the miracles of expansion that it has performed in recent years, and to meet the heavy capital demands that this program of expansion entailed.

"But the relief accorded by these laws was only temporary; and in the case of U. S. Steel it will largely disappear within the next two years . . ."

"So it seems to me that the best solution to that problem lies in a prompt and realistic revision of the depreciation laws—a revision that is already long overdue. And failing that, the only other possible solution is for us to recognize frankly that (even a good profit year) will be woefully inadequate to finance our replacement and any appreciable part of our expansion needs in the years ahead.

"So if we are to keep pace, as we must, with the growing demand for steel in this nation, we shall need to add to that profit substantially."

The impact of the closing out of steel expansion goals under the fast-tax incentive program in 1955 will hit the mills in the next year. Amortization on projects approved in early years of the program will have been completed. This will tend to inflate company profits and increase taxes. For instance, in 1955 U. S. Steel was able to set aside $145 million for special depreciation—money that will have to be dug up elsewhere when the fast-tax boon runs out. Also, company earnings for tax purposes were decreased by that amount. This is not all gravy to the mills, since they would have been able to take "normal" depreciation—20 to 25 years—had fast-tax certificates not been granted.

Without fast-tax privileges, or a more realistic depreciation policy, financing of steel expansion will be that much tougher. It could result in some projects being held in abeyance until individual mills have a clearer picture of where the money is coming from. J. & L., for instance, is non-committal about its Texas mill. Other long-range programs may be modified or delayed.

Prices Enter Picture

And while mills usually are reluctant to talk about it, there is a relationship between steel prices and depreciation.

Mr. Blough talks of price increases as a "last resort" answer to the problem of financing expansion. But he's also frank enough to admit that "in the absence of a more realistic treatment of depreciation, there simply is no other course." The big uncertainty on this approach is that making price increases stick depends on market conditions. The mills also are under the moral suasion of President Eisenhower to hold prices in restraint in the interest of combatting inflation.

The mills have a good case when when they argue that present depreciation laws, based as they are on original cost, are far from adequate to provide the nest egg necessary to replace outmoded equipment.

Here's the way some mills reacted to news of the fast-tax turndown:

Jones & Laughlin: No decision on Texas pipe mill. But $320 million cost reduction and expansion program probably will be carried through to completion.

U. S. Steel: Will definitely go ahead with plans to add 670,000 tons to steel capacity in Pittsburgh and 1.3 million tons in Chicago.

Youngstown Sheet & Tube: Projects now underway will not be affected by fast-tax decision.

Sharon Steel: Decision will not alter plans for expansion.

How One Steel Executive Looks At Fast-Tax:

"If accelerated amortization is denied, net reported earnings to the stockholders will, of course, be higher, but because federal taxes on income will also be higher, cash earnings—the source of funds for expansion and dividends—will be lower.

"There are obvious limits to the amounts of bonds and equity securities that can be sold. Consequently, in the absence of substantial relief on the amortization front, steel management will either have to generate additional cash through higher earnings obtained by additional price increases or will have to reduce expansion plans.

"The only other source of cash would be to reduce dividends—a policy which would be most shortsighted because it would foreclose the possibility of equity financing."

—A. B. Homer, President
Bethlehem Steel Co.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

U. S. Vetoed Fast-Tax For These Steel Projects

ACME STEEL CO.

Openhearth furnace	Burnham, Ill.	$15,421,000

ALAN WOOD STEEL CO.

Iron, ingots	Conshohocken, Pa.	7,039,000

ALLEGHENY LUDLUM STEEL CORP.

Rolling mills	Various	7,661,000

ARMCO STEEL CORP.

Pig, ingots, finishing	Ashland, Ky.	136,396,000
Stainless sheet, strip	Butler, Pa.	55,271,000
Pig, ingots, finishing	Houston, Tex.	118,000,000
Metallurgical coal	McAlester, Okla.	5,000,000
Sheet and strip	Middletown, O.	42,208,000

BETHLEHEM STEEL CO.

Heavy plate and shapes	Lackawanna, N. Y.	248,970,000
Add'n to rolling mill	Steelton, Pa.	6,585,000

BETHLEHEM PACIFIC COAST STEEL CORP.

Ingots, semi-finish & finishing	Seattle, Wash.	27,895,000

COLORADO FUEL AND IRON CORP.

Blast furnace & auxiliaries	Claymont, Del.	33,177,000
Openhearth additions	Pueblo, Col.	2,069,000

CRUCIBLE STEEL CO.

Coke oven, rolling mill	Midland, Pa.	62,818,000

DETROIT STEEL CORP.

Openhearth	Portsmouth, O.	16,445,000

GRANITE CITY STEEL CORP.

Pig, other finishing	Granite City, Ill.	173,075,000

GREAT LAKES STEEL CORP.

Coke, slabbing, sintering	Zug Island, Mich.	52,600,000

H. K. PORTER CO.

Ingots, finishing	Huntington, W. Va.	3,973,000

INLAND STEEL CO.

Misc. facilities	East Chicago	40,894,000
Rolling mill, utilities	Indiana Harbor, Ind.	107,225,000

JONES AND LAUGHLIN

Steel tubing mill	Houston, Tex.	250,000,000

KAISER STEEL CORP.

Misc. facilities	Eagle Mountain, Calif.	10,000,000
Steelmaking facilities	Fontana, Calif.	55,000,000

LATROBE STEEL CO.

Blooming mill	Latrobe, Pa.	7,555,000

LONE STAR STEEL CO.

Steel tubing increase	Lone Star, Texas	7,805,045

LUKENS STEEL CO.

Steel plate	Coatesville, Pa.	40,000,000

McLOUTH STEEL CORP.

Pig iron, ingots	Detroit, Mich.	100,250,000

NATIONAL STEEL CO.

Pig iron, ingots	Weirton, W. Va.	18,900,000

PHOENIX IRON AND STEEL CO.

Blast furnace, other	Phoenixville, Pa.	134,225,000

PITTSBURGH STEEL CO.

Rolling mill add'n	Monessen, Pa.	8,400,000

REPUBLIC STEEL CORP.

Sheet mill	Cleveland, O.	4,500,000
Seamless steel pipe	S. Chicago, Ill.	2,149,000

SHARON STEEL CO.

Electric furnaces (2)	Farrell, Pa.	8,050,000
Steel slabs and blooms	Farrell, Pa.	6,728,000

U. S. STEEL CORP.

Ingot addition	Braddock, Pa.	1,420,000
Various facilities	Chicago	64,926,000
Ingot addition	Duquesne, Pa.	7,924,000
Additions, coke	Gary, Ind.	145,698,000
Steel tubing mill	Lorain, O.	74,858,000
Steel tubing mill	McKeesport, Pa.	81,304,000
Integrated additions	Morrisville, Pa.	86,400,000
Ingot, plate, stainless	Munhall, Pa.	15,128,000

YOUNGSTOWN SHEET AND TUBE

Pipe and tubing	Campbell, O.	24,375,000
Seamless tubing	Youngstown, O.	1,579,000
Tubing, sheets	East Chicago, Ind.	10,513,000

GOVERNMENT

ROADBUILDING: Program In Second Gear

Federal project hasn't resulted in as much new mileage as has been expected . . . Senator Gore asking questions . . . Experts declare way is being cleared for the future—By *R. M. Stroupe.*

◆ CONGRESS and the highway-hungry public are getting impatient with the national road improvement program. Critics believe the project is moving too slowly.

The big federal-aid highway law passed by Congress last year has induced less new mileage than was expected. Most bottlenecks that tormented drivers are still as bad as in 1956.

That's the point of view expressed by Sen. Gore, D., Tenn., in a complaint of "disturbing tardiness" getting the highway modernization effort into full swing.

He is gathering information from federal officials and roadbuilding experts to find what agencies and what factors are causing the delay. What government spokesmen tell him, in substance, is that the road program isn't rocketing along, but the way is being cleared for faster progress in the future.

Officially, the government hasn't yet revised its estimates of roadbuilding outlays and material needs for 1957. Anticipated spending for all new mileage by federal, state, and local agencies is still $6.8 billion. Total demand for structural, reinforcing, and miscellaneous steel and corrugated metal pipe remains listed as 3,332,000 tons.

Supply Squeeze

But many who work with the program daily feel forecasts made in 1956 may not be met. Roadbuilding funds spent this year probably will not exceed $6.5 billion. Tight supplies of steel, especially structural, may force down the projected use of this material.

John Volpe, the interim Federal Highway Administrator, recognizes the difficulty of obtaining the types of steel and quantities of cement wanted by road builders. Structural shapes and steel plates are very hard to get now, he observes.

But Mr. Volpe tells Congress "considerable relief" from the present hardship is indicated by current development of more steel capacity. And some help for the builders may be found in the use of substitutes, such as prestressed concrete structural members.

While actual contract awards for the 41,000-mile interstate road system amount to only $300 million, many states individually are pushing this effort. Six states, Mr. Volpe says, have obligated all their 1957 interstate funds to this project, and 15 others will spend at least 50 pct of this money.

One obstacle to faster action on the coast-to-coast interstate net is the difficulty of choosing definite sites for various links.

Provisions for the urban links to the interstate routes and for fringe area expressways create another problem. It is proving easier and faster to handle rural projects than to tear out and rebuild as required for construction in the cities.

FEDERAL-AID CONTRACTS ADVERTISED AND FUNDS OBLIGATED IN 1954, 1955 AND 1956

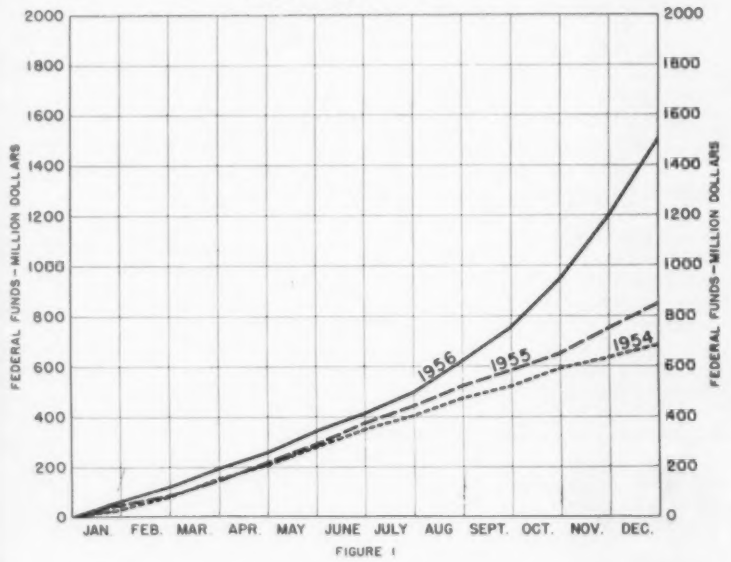


FIGURE 1

More for Research

A new research and development center will be constructed at Pompano Beach, Fla., by U. S. Industries, Inc. The company plans to move into the first units in the third quarter of 1957.

U. S. Industries is a diversified industrial company with 12 divisions active in machine tools, petroleum equipment and machinery for water systems.

GOVERNMENT

BUDGET: Defense Gives It A Boost

Military and foreign aid largely responsible for $3 billion rise in budget requests . . . Tight money policy likely to continue . . . Aid for small businessmen in the works . . . President appeals for moderation.

◆ PRESIDENT EISENHOWER wants Congress to vote a record high (for peacetime) of $71.8 billion for the 12-month period starting July 1, up $2.9 billion over this year.

Influential congressmen on both sides of the political aisle believe he will get all or most of what he asks.

Most of the additional money being asked is for military purchasing.

National defense is becoming more costly, Mr. Eisenhower warns because:

Tension in the Middle East requires additional dollars.

Everything the Pentagon buys made of metal costs more.

Contractors' wage costs are higher and these costs are being passed on to the Government.

Costs Up

As weapons become more complex, they become more costly. Examples: Late-model guided missiles.

Receipts this year will total $73.6 billion, producing a surplus of $1.8 billion. This surplus is likely to touch off new congressional interest in tax cuts. It is close to the $2 billion minimum for a tax cut, and if the business boom continues, will probably go up by close to $1 billion more.

The President calls for continuation of present corporate and excise tax rates until "such a time when a general tax reduction" involving substantial loss of revenue is feasible. But he does ask Congress to give "early consideration" to tax relief for small business by reducing the tax on the first $25,000 of annual corporate profits to 20 pct and raising the surtax to 22 pct.

Budget at a Glance

For the year beginning July 1, income is estimated at $73.6 billion, outgo at $71.8 billion, leaving a surplus of $1.8 billion (to pay off debt).

For defense, total military budget will be $38 billion. $2.6 is earmarked for mutual security, $2.3 billion for atomic programs, and $0.4 billion for stockpile and expansion of defense production.

For national security, the Air Force's total would be $17.4 billion; Navy $10.3 billion; Army $9.1 billion; miscellaneous $1.2 billion.

The price of peace, the President warns, comes high. In addition to expanded defense programs, the new budget calls for increasing expenditures for a wide range of social legislation.

Here's how the defense budget shapes up:

Direct military expenditures for defense will be up an even $2 billion to $38 billion. Total defense expenditures, including mutual security, stockpiling, and atomic energy programs amount to $43.3 billion, an increase of $2.4 billion —three-fourths of the increase.

The President is asking for $2.6 billion for military mutual aid funds for next year, the same as this year, and $4.4 billion for an expanded economic foreign aid program, including a special $2 billion fund for his Middle East security proposal.

Ike Asks Restraint on Prices, Wages

President Eisenhower asks business management and labor leaders alike to keep up "a vigilant guard" against inflationary prices and inflationary wages. (He warns that these tendencies are always present in an expanding economy.)

"Business, in its pricing policies, should avoid unnecessary price increases, especially at a time like the present when demand in so many areas presses hard on short supplies," he says.

"Increases in wages and other labor benefits negotiated by labor and management must be reasonably related to improvements in productivity," he continues. "Wage increases that outrun productivity are an inflationary factor."

In addition, he wants this year's Congress to:

Set up a special commission to study the nation's financial system, including credit, lending, "hard money," interest rates, and purchasing power.

Vote large-scale aid for school construction.

Put the U. S. in the International Atomic Energy Agency.

Raise postal rates.

Reverse the "trend toward ever more devastating nuclear weapons."

Create a bipartisan commission to investigate civil rights.

Make it easier for Hungarians to enter the U. S.

MARKETING

COMPANY CARS: Should You Lease Or Buy?

The situation varies from company to company, but more are finding it to their advantage to lease . . . Among benefits are a reliable fleet and protection from used car market pitfalls . . . By T. M. Rohan.

◆ AUTO LEASING is getting a new look from industry because of the tight money market. Many firms are finding an unexpected windfall in savings and freeing of substantial capital for more productive uses.

Other reasons why more companies are considering a leasing program:

Offers a safe, reliable and quality fleet.

Eliminates risk of reciprocity.

Conceals identity of owner.

Avoids pitfalls of administration in unfamiliar field.

Protects against used car market fluctuations.

Last year alone, 7000 additional cars were changed over to the lease plan by just three companies: a processed dry foods manufacturer, a meat packer and a major insurance firm.

Top-ranking leaders in many industries have had leased cars for years. U. S. Steel Corp. and subsidiaries have 1800 leased cars. Bethlehem (which started leasing 15 years ago), Republic, and Jones & Laughlin lease about 500 cars each. The biggest leased fleet in the country is claimed by Phillips Petroleum, which has over 4000 cars.

Plans Vary

There are at least 700 leasing firms—some very small—who handle over 200,000 cars.

Institutional investors think enough of the plans to make funds available on a long-term leasing basis. Since the car itself is collateral, the loan is better secured and money more easily obtained for it than, say, for expansion in a new plant which must be justified to a banker on market analyses. And at average investment of $2000 per car, tied-up capital mounts fast. Larger leasing firms will make surveys of company fleet operations to check economic aspects.

One leasing system receiving growing attention is the equipment trust arrangement. A leading proponent, Lee Fleet Management of Cleveland, claims actual savings of $300 to $350 per car per year compared to conventional flat rate arrangement. The fundamental difference between it and flat rate is that the leasing firm owns and manages the cars on a fee basis and user does servicing. At trade-in time, both share in any actual profit over the depreciated book value.

Salvage payments are made directly to banks and a reserve is held there to eliminate chances of juggling prices. Users stand any loss but these are invariably due to unrepaired damage. Leasing firms watch used car market conditions closely day-by-day for best trade-in timing, generally 12-15 months after purchase.

Fleet Size Factor

Equipment trust leasing rates are set on a flexible formula based on 2½ pct per month of total capitalized cost and interest of the vehicle. For a Ford, Plymouth, or Chevrolet in Cleveland with radio and heater it would amount to $48 per month.

A flat rate lease which includes maintenance and repairs costs about $92-95 per month so equipment trust users have an incentive to take care of the cars and pile up a margin of savings. Equipment trust is limited to users of 35 cars or more.

You Have To Pay Taxes, But . . .

▪ The predatory antics of some tax collectors and accident victims are reason enough for companies to lease cars rather than own them.

Firms with large auto registrations in a given state, but little else in taxable facilities, are sitting ducks for revenue seekers.

As one company puts it, "Many states in their search for more revenue are looking hungrily at large corporations doing business within their borders.

"We got rid of our fleet to get our name off the records of states in which we owned no property other than a car."

And accident victims with cagey lawyers soon learn they have a bargaining advantage if their claim is against a corporation easily embarrassed by unfavorable publicity.

Result: More companies are resorting to an equipment trust lease plan. Each car is operated as though the company owns it, but title is in the leasing firm's name.

The plan capitalizes on experience in handling the biggest variable in auto operation, depreciation through used car market fluctuations. Fleet operators are a reliable source of cars in known condition for used car dealers so can get top prices. If a dealer needs cars, leasing firms can replace some in operation with new ones and even offer dealers a selection. And dealers will buy sight unseen on the word of the fleet operator. Fleet operators can also cheaply move cars cross-country to best markets through car transporters, soldiers en route, "drive-yourself" firms.

As new car buyers, leasing firms also are a part of the annual guaranteed market for new models and get them on a factory to dealer allocation cheaper than any single fleet owner.

Royal Flush

One leasing firm owner last year got a late evening phone call from his banker who was playing poker with a company president. Car leasing had been discussed during the game. The president became interested, placed the call and was sold within the week. The ironic part was that the leasing firm had been trying to see a responsible official of the company 3 years.

Company treasurers and comptrollers have all heard tales of vagaries of the used car industry, insurance fee splitting, garage gouging, etc., so actual costs of their own fleets are not really often analyzed.

The hectic post-war used car market produced enough horrible examples to scare off many from dealing in used cars. Yet by the same token, companies pull many boners on cars because their interests understandably lie elsewhere. In 1941, for example, one firm found a salesman collecting $200 per year depreciation from the company on a 1928 Rickenbacker worth $25. Another found 64 of 117 salesmen had cars 14 years or older but collecting new-car expenses. A third showed almost half its salesmen were using medium and high-priced cars, which the company was paying for—and at retail levels.

MARKETING

AUTOS: Why Detroit Lags

Many factors are behind slow steel buying from auto industry . . . No pressure to build inventory prompts buy-as-they-go policy . . . Dealers drag their own heels.

◆ WHAT'S behind the current lag in medium price car sales? How is it going to effect the demand for steel from the automotive industry?

January and February are traditionally slow sales months for the auto industry. But the seasonal lag has been more apparent in the medium price class than it has for Ford, Chevrolet and Plymouth.

What's the answer?

Prices Up

In the first place, prices on all automobiles went up with the introduction of the 1957 models. The increase was anywhere from 6 to 7 pct. It was caused by a rise in the price of basic materials combined with increased labor costs and a whopping $1 billion for tooling.

Thus, the public has to pay as much for a high priced Ford, Plymouth or Chevrolet as it previously paid for a low priced Buick, Olds or Pontiac.

But this is not the whole answer. In addition to the increase in prices, there is the matter of dealer independence. A new car dealer is now in a position, thanks to a Federal law, where he can tell the factory that he doesn't want any more cars and get away with it.

Dealers Aren't Worried

Naturally, the dealer is not taking any more cars than he can sell and is making a higher profit on fewer sales.

The current automotive market conditions have steel mills worried. Predictions of record steel production have been based mostly on the feeling that automotive would be one of the biggest and best customers in 1957.

Steel mills have been predicting a big upsurge in automotive demand for steel. It has failed to materialize so far and there are a number of reasons why.

First, automotive steel inventories were in good shape when the industry went into 1957 production. The comfortable condition was brought on by poor sales and production cutbacks in 1956.

It was thought, however, that once new model production really got rolling, inventories would be practically down to nothing.

But because of the many changes that were made in new model cars, production hardly got off the ground in the last quarter of 1956. The result was that inventories were still in good shape at the turn of the new year.

The lag in medium price car sales has served as a damper on the demand for steel.

Inventory No Problem

Perhaps the most important reason of all is the lack of pressure to build up adequate inventories.

Automotive producers know that the steel industry is due for a year of labor peace in 1957. The threat of a major steel strike does not hang heavy over anybody's head. Thus, the auto industry is content to take what steel it thinks it needs and no more.

At the same time, there is no great urgency to build up new car stocks. Producers learned a bitter lesson last year and are doing their best to see that it doesn't happen again. They will make cars in accordance with demand and no more. This also reflects on the demand for steel.

The only possible chance of an inventory building spree is the possibility of an increase in the base price of steel.

FUEL

OIL: Drilling Demands Mount

It'll be touch-and-go for steel to meet petroleum industry's future demands . . . Requirements for oil country goods may double by 1965—*By G. J. McManus.*

◆ STEEL MILLS are already breathing hard in their race to keep up with the needs of the petroleum industry.

To users of oil country goods, who have orders placed as far ahead as 1958 or 1960, it may seem that the steel industry won't have it to meet the pace of the next ten years.

But makers of tubular products can defend their record in meeting oil country needs. They point out that shipments of oil country tubular products have increased 127 pct since 1945. In that time, shipments of all steel products went up only 48 pct.

Consumption Mounts

Here's the way it looks today:

Demand for oil country tubular products may double by 1965. Shipments of these products are currently running over 2.5 million tons a year; mills are booked well into 1957.

Demand for linepipe is expected to increase 15 pct in the next six years. One mill is booked solidly through 1959 right now; others are into 1960.

Behind this ordering is rising oil consumption. This country uses 8 million barrels a day now. We will need nearly 13 million barrels daily by 1965. Of this amount, about 10 million barrels are expected to come from domestic wells. These are currently yielding 7 million barrels a day.

To provide the extra 3 million barrels, oilmen will increase drilling activity from 59,000 wells now to 85,000 in 1965. To do this, they will need more steel. The questions: How much? Will it be available?

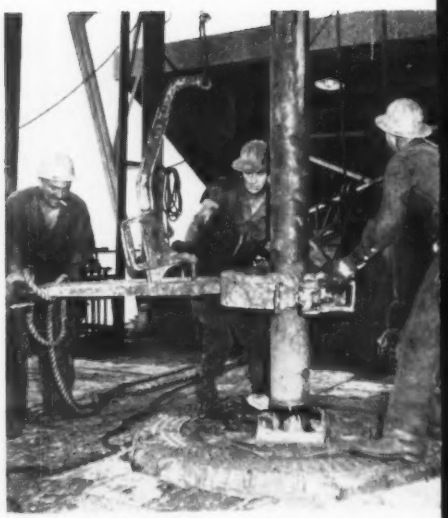
One answer comes from H. J. Wallace, vice president, sales, National Tube Div. of U. S. Steel. He tells oilmen: "You will need 3.2 million tons of tubular oil country goods (annual average, 1960-65), or 26 pct more than you are now consuming."

Tough to Estimate

Alongside another mill's figure of 5.1 million tons needed domestically in 1965, Mr. Wallace's estimate is conservative.

But the mills have a complicated job in gaging the relation of oil consumption to steel needs. For one thing, two-thirds of the world's proven oil reserve lies in the Middle East. This area will supply an increasingly large percentage of the petroleum consumed in the United States.

Middle East oil production will rise from under 4 million barrels a day now to over 9 million barrels a day in 1965. In the same period, U. S. imports will increase by over a million barrels a day.



Photos by Associated Photographers

Significance of this lies in the fact that less steel is needed to get at Arabian oil. Wells are shallower than in the U. S.; fewer wells are needed.

Another point that gives the mills pause is offshore drilling. It's estimated that the amount of oil taken from offshore sources will increase from 55,000 barrels a day in 1955 to 720,000 barrels daily in 1965.

Here again, steel requirements are affected. The oil companies have staked out huge sections of offshore fields. They will prob-

What Can Be Done In Oil Emergency

■ **Oil industry experts indicate that in an emergency the U. S. could increase its petroleum output by 2.1 million barrels daily. Of this, 1.85 million can be produced in areas of the Midwest, Gulf Coast states, and Rocky Mountain states.**

■ **Ability to produce petroleum exceeds availability of transportation systems, such as pipelines, barges, tank cars. Under emergency conditions, existing facilities could move 1.1 million additional barrels daily as follows:**

By increasing flow through pipelines to the Gulf Coast.

By using railroad tank cars to serve Gulf Coast ports.

By using excess pipeline capacity to Illinois and Ohio and tank cars from these points to the East Coast.

By using barges, trucks and tank cars from Texas and Louisiana Gulf Coast producing areas to move oil to tidewater.

TANKERS NEED STEEL

■ **Further demands on the steel industry from the petroleum producers come from the tanker program stemming from the closing of the Suez.**

■ **Plate requirements, already as tight as possible, are due to expand with the new tanker building. Nearly 400,000 tons of plate went to shipbuilders in 1955.**

ably be able to tap fields with fewer wells than on dry land, where holdings are relatively small. One steel man says there will be about one-tenth as much drilling as for comparable quantities of onshore oil. He feels the current 90 rigs off the Gulf Coast will never increase beyond 200.

Allowing for these and similar factors, other authorities still expect the annual U. S. drilling rate to increase by more than 25,000 in the next 10 years. They expect average well depth (now around 4000 ft) to increase by 100 ft a year. They expect pipe needed per 1000 ft of hole (now 11 to 11.5 tons) to increase by 200 lb a year, at least.

Linepipe Prediction

The indicated increase in average depth is important on two scores: It adds to total footage. And the deeper you go, the more steel you need per foot because heavier pipe is needed to take the strain. The last figure increases sharply when wells go down more than 5000 ft.

The picture for linepipe is even more difficult to chart. In 1954 there were 54,000 wells drilled. Despite this lively activity, little linepipe was laid. Every large electric weld pipe mill was shut down for three months at one stage.

Shortly after, demand for linepipe snapped back. Last year 25,000 miles of pipeline were laid, with about half going to natural gas. This year's figure will be about the same, but would be higher if the mills could get more plate. One pipe mill was down to two turns a day until recently because of the plate shortage.

For the future, one estimate sees demand rising 15 pct in the next 6 years. Purchasing agents for the oil companies are ordering pipe four and five years ahead. They're taking every bit they can get and crying for more.

One notion that seems to have been dispelled is that demand for linepipe would level off and decline once a few big arteries were completed. There were only 139,000 miles of pipeline in operation in 1954. Yet postwar mill shipments have totaled 265,000 miles for main lines and 100,000 miles for gathering and distribution lines. The difference between shipments and lines in use indicates the extent to which pipe has been retired or has been discarded in favor of more efficient sizes.

It indicates also that demand will continue, even after a nationwide network is completed.

Regarding future expansion, Mr. Wallace of National Tube feels that "For the long pull . . . the needs of the oil industry will be met. He points out, however, that the mills will need new facilities to get significantly more tubular products. He sees little chance of a large increase in production in the next few years. He sees little chance of an early end to the supply pinch.

Estimates May Be Low

Although several expansion plans are in the works, mills will be pressed to keep up with domestic petroleum needs. There is an excellent chance that current estimates of oil consumption will prove to be on the low side. Past estimates have invariably turned out that way. Oil consumption has been increasing at the rate of 4.8 pct a year since 1923. If it continues at this rate, U. S. consumption will be around 15 million barrels a day by 1965. In arriving at a figure under 13 million barrels, The Chase Manhattan Bank lopped about 2 million off to allow for a depression.

Could Hit Peak

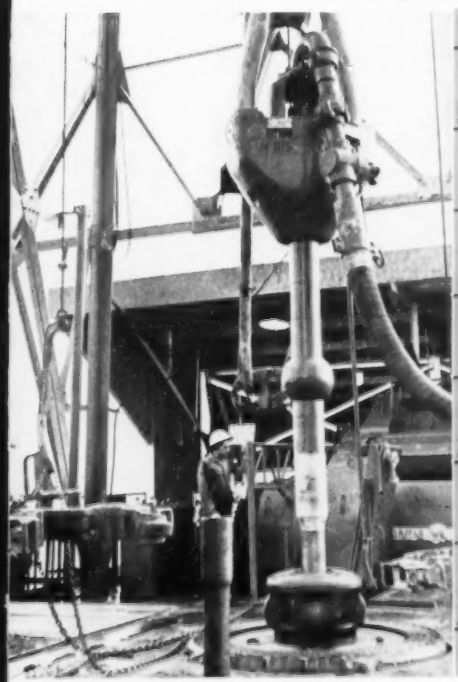
However the period after 1965 is hazy. U. S. crude oil production is due to hit a peak about 1970. After that, domestic production will skid in a hurry. By the year 2005, we will be back at the level of 1915.

Increased foreign production is expected to make up the difference. But foreign oil fields are a long way from American pipe mills.

Expansion of oil country goods manufacturing facilities were hit by the government's veto of fast-tax writeoffs. Jones & Laughlin, for example, had asked for a certificate of necessity for an integrated mill in Texas.

Can Steel Meet Oil Country's Needs?

Estimated demand for tubular products



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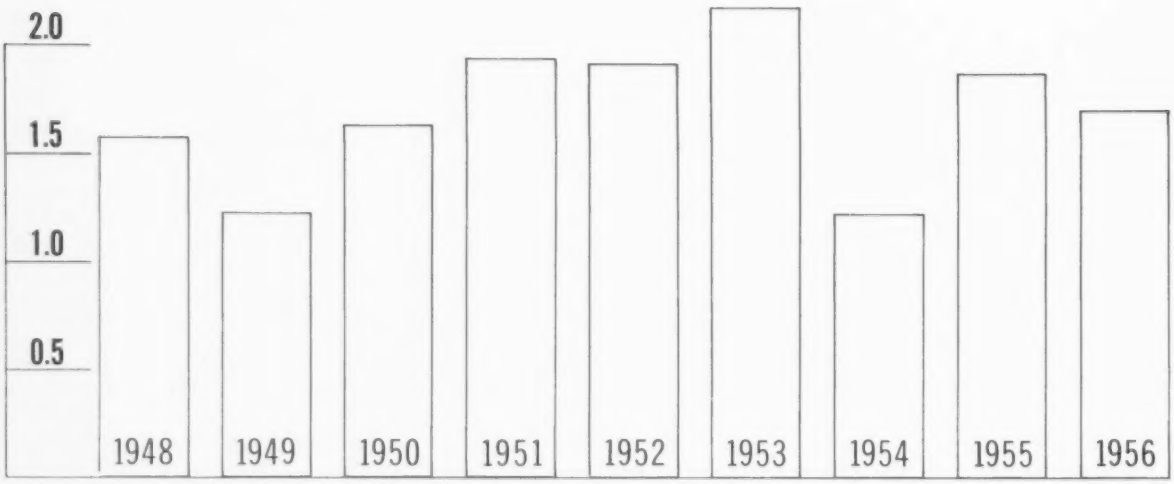
PRODUCTION

BARS: Reliable Economic Barometer?

Shipments of cold finished bar, long felt to reflect business activity, were slow in coming back after strike . . . Producers are optimistic, however . . . Inquiries and ordering register gains.



Shipments of Cold-Finished Bars (in Millions of Net Tons) Source: AISI

◆ "WE'RE GETTING a pickup in cold finished bar business from the small buyers. Activity in this area always precedes a general pickup in volume."

"The orders we're shipping, and generally on short notice, are to customers we couldn't talk to three weeks ago. This new business is coming from accounts where we didn't think we had a chance."

"We've finally broken loose some automotive orders. We're receiving some more business from a major farm equipment account."

These statements — from mill sales personnel — indicate how closely they're reading the tea leaves to see if cold finished bar is on the road back.

Long regarded as a barometer of business activity, cold finished bars encountered rough weather during 1956. After chalking up a record first half, surpassed only by the first half of 1953, they sagged. Strike-lost tonnage brought about a low of only 152 thousand net tons in July and August.

A pickup to 124,000 net tons was reported in September, and there was a further gain to 152,000 net tons in October. The overall picture is not too bright but producers are encouraged.

For one thing inquiries are up. There's more ordering activity, even though the aggregate tonnages booked are small. Buyers apparently aren't buying more, they're just buying more frequently. Plagued by credit tightening, small consumers are relying on more frequent buying to keep credit lines open.

Disregarding any drawbacks, cold finishers are optimistic. They expect the first quarter of this year to be only slightly under 1956 levels in ordering. And the first quarter '56 was a period of becoming activity. Current thinking suggests a gain in average monthly tonnages of at least 7 to 10 pct this quarter over the fourth quarter of last year.

Bar Stars Under Heat

Some of the techniques of elevated temperature drawing of bar stock—a process being given attention by barmakers—have been disclosed by LaSalle Steel.

Stock is drawn at temperatures near the lower critical temperature range. With this LaSalle offers a bar with guaranteed Rockwell C values of 30, tensile strength ratings of 140,000 psi and yield strength of 125,000 psi.

While exact temperatures at drawing were not revealed, those around 900°F appeared on charts shown when the process was explained. Product manufactured under these conditions is reported to eliminate necessity of post-drawing heat treating.

This ETD material is described as machining about 25 pct faster than annealed alloy steel and as much as 100 pct faster than alloy steel heat treated to the same strength level. Price is roughly comparable with annealed 4140 alloys, according to LaSalle.

BLISS

TIPS FROM A ROLL MAKER'S NOTEBOOK

MACKINTOSH-HEMPHILL DIVISION, E. W. BLISS COMPANY, Pittsburgh 3, Pennsylvania

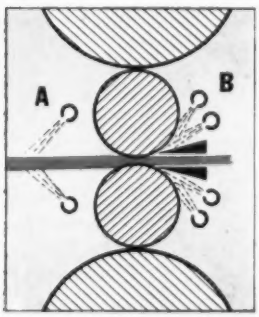
Cast mill rolls • Johnston cinder pots • rotary tube straighteners • end-thrust bearings • heavy-duty lathes • steel and special alloy castings

Choosing work rolls for hot strip finishing trains

In continuous hot strip mill operation, the highest frequency of time-consuming roll changes usually occurs in the early stands of the finishing train. Conditions here are severe: the reductions taken are heavy, and the strip is still thick enough to carry much of its original heat.

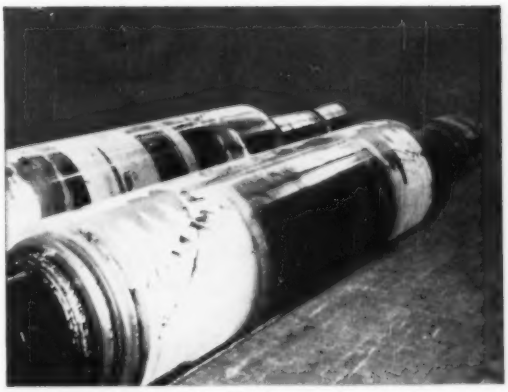
Water: the secret of longer roll life—Banding is a chief cause of premature roll failure in these stands. This peculiar tendency is related to the amount and size of graphite in a roll's surface, and to the adequacy of the cooling system. At high temperatures, graphite tends to pull out of the surface, leaving tiny fissures. Rolling pressure then forces in small particles of scale. These offer footholds for further scale build-ups, which are rapidly rolled into elongated bands.

Thus, cooling is vital. Water should be applied at a pressure of 140-to-200 psi, and in such a way that a large volume actually reaches the roll surface. The nozzle arrangement should be designed to create uniform cooling over the entire work surface. In some cases, additional sprays on the pass line are necessary.



EFFECTIVE WATER APPLICATION includes high-pressure sprays (A) aimed against the strip to push the scale out of the rolls and high-pressure water (B) in large quantities applied to the roll surfaces as close to the point of contact with the strip as the mill design permits.

Choice of rolls can make or break a rolling schedule—Where it is impractical to cool the rolls thoroughly, it is still quite possible to minimize roll changing by using Mack-Hemp *Midland Superalloy* rolls. These are nickel-chromium-molybdenum alloy steel rolls containing no graphite and capable of being heat treated to high hardness levels. As a result, they are extremely resistant to spalling and fire cracking, affording no foothold for scale.



ROLL BANDING on hot strip mill work rolls is a principal cause of uneven gage across the width of the strip. It brought about the early removal of this pair of rolls.

Where rolls can be adequately cooled, *Mack-Hemp Nironite "F"* double-poured high-nickel grain rolls actually will roll greater tonnages than alloy steel rolls. The indefinite chill of the first pour keeps the graphitic content of the iron low near the roll surface, while the second pour produces a strong, ductile core.

For less severe conditions, the *Mack-Hemp Nironite A or B* grades of grain roll give an excellent account of themselves. Although they show more graphite near the surface, they frequently turn in surprising tonnages between roll changes.

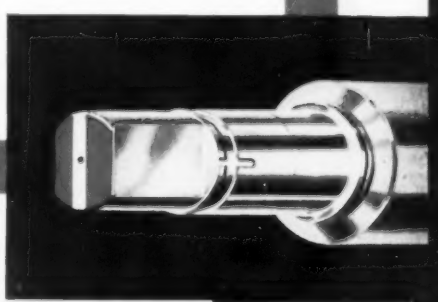
Mack-Hemp is as interested as you are in securing maximum output from your mills. If there are troublesome "roll-wreckers" among them, why not call upon us for help in selecting rolls to beat your special problems? There's no obligation. Write us today.

MACKINTOSH-HEMPHILL

You get more tonnage from the rolls with the Striped Red Wabblers

Division of E. W. BLISS COMPANY

Presses, Rolling Mills, Special Machinery



EXPANSION IN INDUSTRY

Oxygen Process:

First license out for Stora Kal-Do.

The first license has been granted for the Stora Kal-Do rotary oxygen steelmaking process. (THE IRON AGE, Oct. 18, 1956, P. 126.)

Trafikaktiebolaget Grangesberg-Oxelosund, big Swedish mining company is installing two 80-ton Kal-Do rotary converters. Annual steel ingot capacity, when completed early in 1960, will be 475,000 net tons.

Existing blast furnaces and coke ovens will be expanded at Oxelosund, Sweden to take care of the new steel expansion. Included in the project is plate (ship plate and other grades) rolling capacity amounting to 330,000 net tons a year.

More than 2,000 new workers will be required by 1960. The Swedish firm will use 500,000 tons of its 2,000,000 tons annual production of high grade ore.

Coal for the required 250,000 tons of coke will be imported in the firm's own ships in exchange for outgoing ore shipments.

The cost of this substantial (for Sweden) expansion is set at $40,000,000. It is understood that this initial license granted by Stora Kopparberg will pay for all the research and preparation in the development of the rotary process. More than 10 American steel firms have or will soon investigate the rotary oxygen steelmaking process in Sweden since the exclusive story appeared in THE IRON AGE.

Hemisphere Growth

National Cylinder Gas Co. is planning to expand its industrial gas production plants at Chicago, Venezuela and Puerto Rico.

A $3 million addition to NCG's liquid oxygen plant in Chicago will increase that plant's output by 150 pct. In Venezuela, equipment has been ordered to double capacity of the oxygen plant at Maracay. The company also is building an oxygen plant at the iron ore port of Puerto Ordaz.

At San Juan, Puerto Rico, construction will start this month on an oxygen and acetylene plant. All told, the program will bring to 78 the number of installations NCG will have in operation.

Kitchens:

Republic expands cabinet plant by one-third.

Republic Steel Corp. is expanding productive capacity of its Canton, O., kitchen cabinet plant. The new addition, which will increase output by one-third, is the second major increase in the past two years. An expansion in 1955 boosted capacity by more than 30 pct.

Facilities to be added include an additional conveyor line that will move cabinets from original assembly points to final crating lines through Bonderizing equipment, electrostatic spray room, and high temperature bake ovens.

The new facilities are expected to be in operation before July 1.

New Scovill Tube Mill

Scovill Manufacturing Co., is planning a new tube mill on a 93-acre tract just purchased in New Milford, Conn. The new plant will concentrate on tube drawing, annealing and related operations. The company's present mill in Waterbury will continue to cast billets and perform extrusion operations.

The New Milford mill will consist of a building 1150 x 200 ft, and will employ 200 at the start of operations. Construction is expected to be started next spring.

Double Capacity

Erie Forge & Steel Corp., Erie, Pa., is starting a $4 million expansion and modernization program which will ultimately include two 75-ton and one 15-ton electric steelmaking furnaces plus a new steel foundry.

When the program is completed, Erie's steel capacity will be double its current rated capacity of 234,000.

Work on one 75-ton furnace and the foundry will start immediately. All financing has been arranged on a long term basis through private institutions, and a certificate of necessity has been obtained to permit amortization of a major portion of the new facilities over a five year period.

Armco Reverse Split

Armco Steel Corp. has offered its common stockholders rights to 1,088,179 additional shares of stock at $56 per share on the basis of one share for every 10 already held.

The offering is described as one of the largest by an industrial company in recent years. Profits will go into a general fund for expansion and working capital.

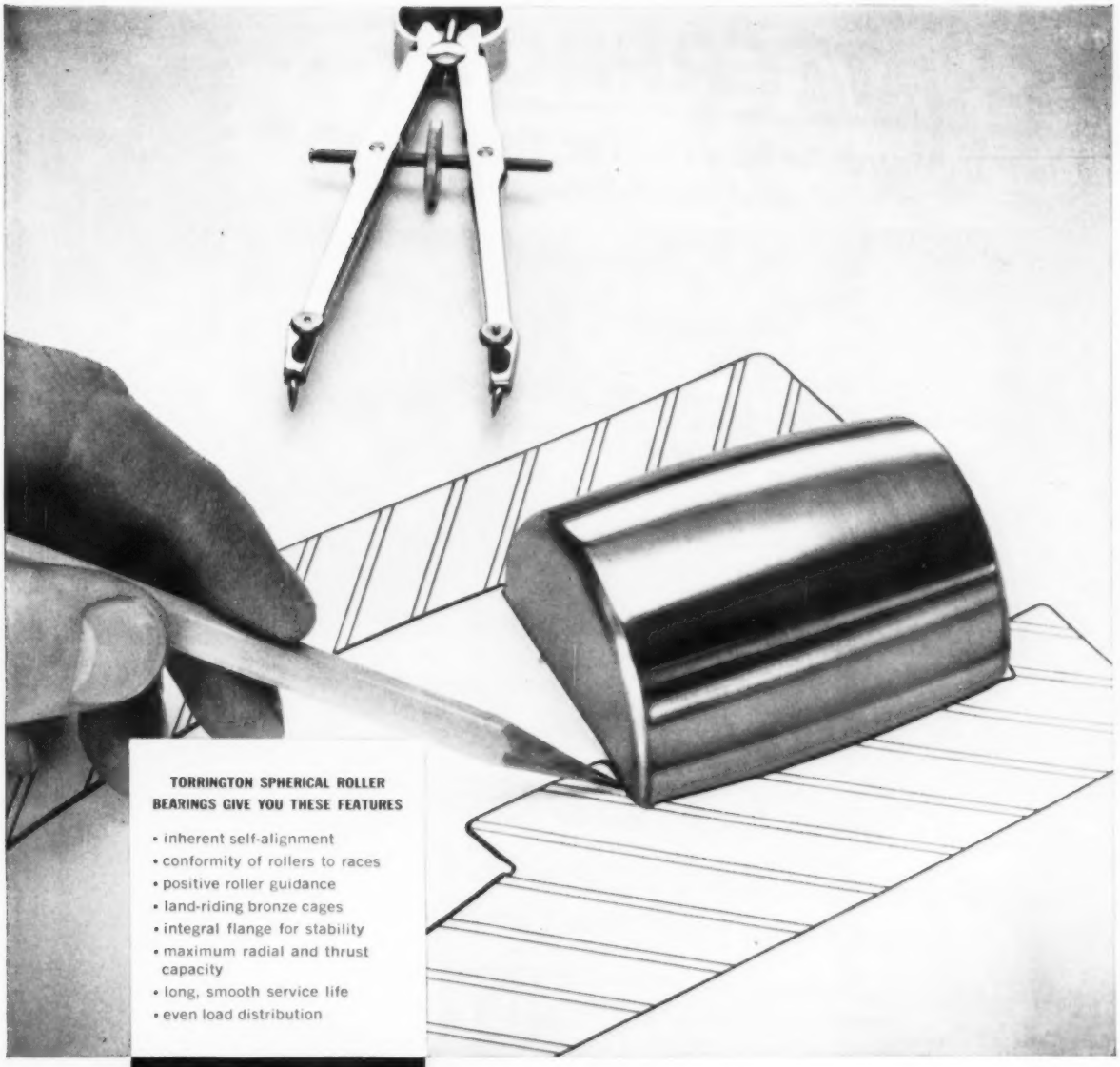
The offering is underwritten by a nationwide group headed by Smith, Barney & Co., New York.

Adding to the New

Addition of warehouse space to their recently-built North Wales, Pa., plant has been announced by Leeds & Northrup Co., Philadelphia, maker of automatic electronic instruments and controls.

Warehouse will be an extension of the present building, covers 43,200 sq ft, and cost about $375,000.

The company has also begun design studies for a research and development building, also to be located at North Wales.



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Roller end and flange surfaces alike are ground to a common spherical radius centered on the common vertex of bearing axis and roller axis. Under all load conditions, the rollers bear lightly but constantly against this flange. This guides the roller positively with minimum friction and prevents skewing. Stress concentrations leading to early failure are avoided, so the bearing will serve you many good turns longer.

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What's more, "Weld-Edge" Blades have a specially heat treated back that is not only shatterproof but possesses greater rigidity that pays off in straighter cuts and longer life.

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YOUR GUIDE TO COLUMBIA DIE AND SHOCK STEEL GRADES

TYPE AND GRADES	DESCRIPTION	HARDENING RANGE	QUENCH	TEMPERING RANGE	USEFUL HARDNESS
D3 — SUPERDIE	High carbon, high chromium, high production, oil hardening type with maximum resistance to abrasion for highest production	1700° F. to 1750° F.	Oil or Salt Bath	400° F. to 1000° F.	65/55 Rc
D2 — ATMODIE **D2S — ATMODIE SMOOTHCUT**	Air hardening, high carbon, high chromium, non-deforming heavy duty long run die steel with better toughness — also available with smoothcutting additives	1800° F. to 1850° F.	Air	400° F. to 600° F.	62/58 Rc
A2S — E-Z-DIE SMOOTHCUT	Air hardening 5% chromium, deep hardening die steel with smoothcutting additives for maximum economy	1750° F. to 1825° F.	Air	400° F. to 600° F.	62/58 Rc
01 — EXL-DIE	Standard manganese chromium tungsten non-deforming oil hardening die steel for guages, plastic molds, jigs and fixtures	1450° F. to 1500° F.	Oil	350° F. to 450° F.	64/60 Rc
S1 — BUSTER ALLOY	Tungsten chromium oil hardening shock resisting steel for heavy duty dies and punches for cold and hot work available in .50% carbon for maximum shock resistance, .60% carbon for best cutting edge life	1650° F. to 1750° F.	Oil	400° F. to 800° F.	61/52 Rc
S5 — CEC SMOOTHCUT	Silicon manganese alloy steel plus smoothcutting additives for heavy punching, shearing and shock applications, also tool shanks	1550° F. to 1600° F. 1600° F. to 1650° F.	Water Oil	400° F. to 600° F. 400° F. to 600° F.	62/57 Rc 62/57 Rc

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Detroit 3 — 121 Oakman Blvd. — Phone TUlsa 3-3770
Los Angeles 22 — 6955 E. Bandini Blvd. — Phone RAymond 3-4684
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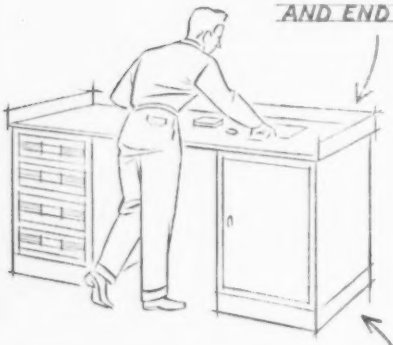
HOW TO USE STANDARD HALLOWELL UNIT WORK BENCHES AND ACCESSORIES IN PLANT MODERNIZATION

ADD TOP SHELF

MODEL 640 - BENCH TOP, DRAWER UNIT, CABINET UNIT, TWO BASES

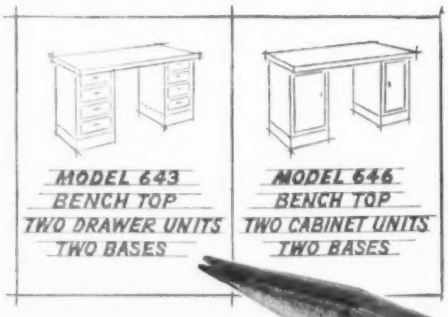
ADD BACKBOARD AND END PIECES



ASSEMBLE THEM IN CONTINUOUS LINE - JOINED IN THE MIDDLE OF THE UNITS OR BUTTED END-TO-END

USE THEM AS INDIVIDUAL BENCHES

4 TOP MATERIALS, 2 LENGTHS, 2 WIDTHS
2 HEIGHTS – ALL STANDARD



MODEL 643
BENCH TOP
TWO DRAWER UNITS
TWO BASES

MODEL 646
BENCH TOP
TWO CABINET UNITS
TWO BASES

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REPORT TO MANAGEMENT

Well, What About Inflation?

Just about everybody, now, is convinced that this year will top them all in business activity. This is generally interpreted to mean prosperity and abundance for all.

But inflation, which has never really been out of the picture for some months, continues to rear its ugly head. That the costs of products, materials and services will rise is also generally accepted. But whether this actually constitutes dangerous inflation is not a question of general agreement.

Blame it all on the Suez and a probable, thumping foreign aid program for the Middle East. That's what you'll be hearing a lot of from now on. But remember, that's on top of an economy that was already strained to its limits on civilian demands.

Even the Experts Disagree

The extent to which the Middle East crisis will stretch or inflate the economy brings out differences of opinion.

One Wall Street expert, Walter K. Gutman (Goodbody & Co.), has this to say: "This writer has said he doesn't believe we are in for a real inflation and that is still his opinion. Even more, . . . we are not in for the type of inflation that is certain or even likely to be profitable to holders of the average stock." Bear in mind that this is market advice, not necessarily applicable to business decisions.

That exponent of the "Defense Cycle," Eliot Janeway, believes that the U. S. is on the verge of a new kind of inflation—foreign aid inflation. He says foreign aid is about to emerge as the "decisive trendmaking factor in the American economy."

This is a logical conclusion for Mr. Janeway to make. It carries out his Defense Cycle business theory, a controversial economic theory described in detail previously in THE IRON AGE, March 1, 1956, p. 34.

Mr. Janeway believes that American businessmen are seriously underestimating the impact of foreign aid on the 1957 business trend. "No previous experiment in foreign aid has exerted such a decisive, direct, and above all, speedy influence on the business trend here as our new effort to end the Suez crisis will," he predicts.

These two experts may not be comfortable in each other's company. They are advising two different groups, one the stockholder; the other, the active businessman.

Why Workers Get Fired

A long way from forecasting long term business trends is the problem of discharging workers. If your personnel department does most of its firing for absenteeism or poor workmanship, it's following the pattern of most industry.

Personnel officers of 129 plants were asked by the American Management Assn. to state the reason for firing the individual worker most recently discharged in their plant.

Absenteeism scored the highest. It was directly responsible for 35 of the 129 firings. But poor job performance was blamed for 28 firings, was a factor in 28 more.

You are probably convinced that absenteeism is a greater problem with women workers than with men. Not so, according to the survey. It shows that 31 pct of male workers fired were discharged for that reason. Only 9 pct of female firings were attributed to unauthorized or excessive absence from work.

If you're unconvinced, the survey probably is too. It concludes, lamely, that employers consider losing time from a job more serious for a man than a woman . . . that they are inclined to overlook a certain amount of lost time by female workers.

INDUSTRIAL BRIEFS

Beat the Heat . . . The Vanadium-Alloys Steel Co., Latrobe, Pa. is marketing a new, hot work die steel for forging temperature alloys. "Jet Forge" is a high chromium steel offering toughness and wear resistance on high temperature applications involved in forging jet parts. It is available from stock as bars, billets, discs and forgings.

Getting Ahead . . . Arrow Tool Co., Inc., is doubling its Weathersfield, Conn., plant. The company specializes in instrument prototype and production work and designs and builds jigs, fixtures and carbide tools. A production subsidiary has also been formed, Mech-tron Instrument Corp., which will produce precision electro-mechanical components and assemblies for electronics and business machines.

Merger In The Rockies . . . C. A. Norgren Co., Englewood, Colo., has purchased the diecasting firm of Stemac, Inc., Denver. The name of the new concern is Norgren-Stemac, Inc. No change in operating personnel of Norgren-Stemac, Inc. is planned. Operations will continue from the present plant location.

Spliced And Taped . . . Thomas A. Edison Inc. and McGraw Electric Co. merged to become one of the largest firms in the electrical industry. New name is McGraw-Edison Co. Prime reason for acquisition of the Edison Co. by McGraw is its research and development laboratory, which has recently expanded at a cost of about $2 million.

Mortar For Porter . . . H. K. Porter Co., Inc., has acquired The Mullite Refractories Co., Shelton, Conn. Mullite will be combined with Porter's Laclede-Christy Division.

Now Hear This . . . A nuclear reactor will be provided by the Air Force to assist the Bell Telephone laboratories, Whippany, N. J., in carrying out an expanded program for research in nuclear physics. Aim is to make available more information about the electric, magnetic, and structural properties of solids, and to study the effects of nuclear radiation on various materials and components used in military electronic systems.

Titanium From National Lead . . . The Niagara Falls plant of National Lead Company's Titanium Alloy Manufacturing Div. will expand its manufacturing facilities. A new building for the expanded production will house new equipment consisting of mills, pulverizers, mixers, dryers and tanks with necessary handling equipment. Four thousand additional kilowatts of 60 cycle power will be made available for the expansion.

Pan-American Progress . . . A contract for the complete control system for a 100-kw nuclear reactor to operate in South America has been awarded to Leeds & Northrup Co. by the Babcock & Wilcox Co. The swimming pool-type reactor is being constructed by Babcock & Wilcox for Sao Paulo University, Brazil. It will be used by the University for nuclear research projects.

Paper Change . . . NRC Equipment Corp. will be the new name of the Equipment Division of National Research Corp. The company manufactures industrial high vacuum process equipment. Richard S. Morse, president of National Research, said the change is consistent with company policy to decentralize the management of its operating subsidiaries.

Debit Unearned Income . . . Savings of $6,917.50 in duburring and polishing of stainless steel tubular parts has won second prize for J. Bishop & Co. of Malvern, Pa., in a recent contest. The award includes a $50 check and a certificate. Contest was conducted by Almco, Div. of Queen Stove Works, Inc., Albert Lea, Minn.

Counterattack . . . Facilities costing more than $1 million will be completed this month at the Knolls Atomic Power Laboratory in Schenectady, N. Y. KAPL is for use in an attack by General Electric scientists on the increasing technical complexities of nuclear reactor design.

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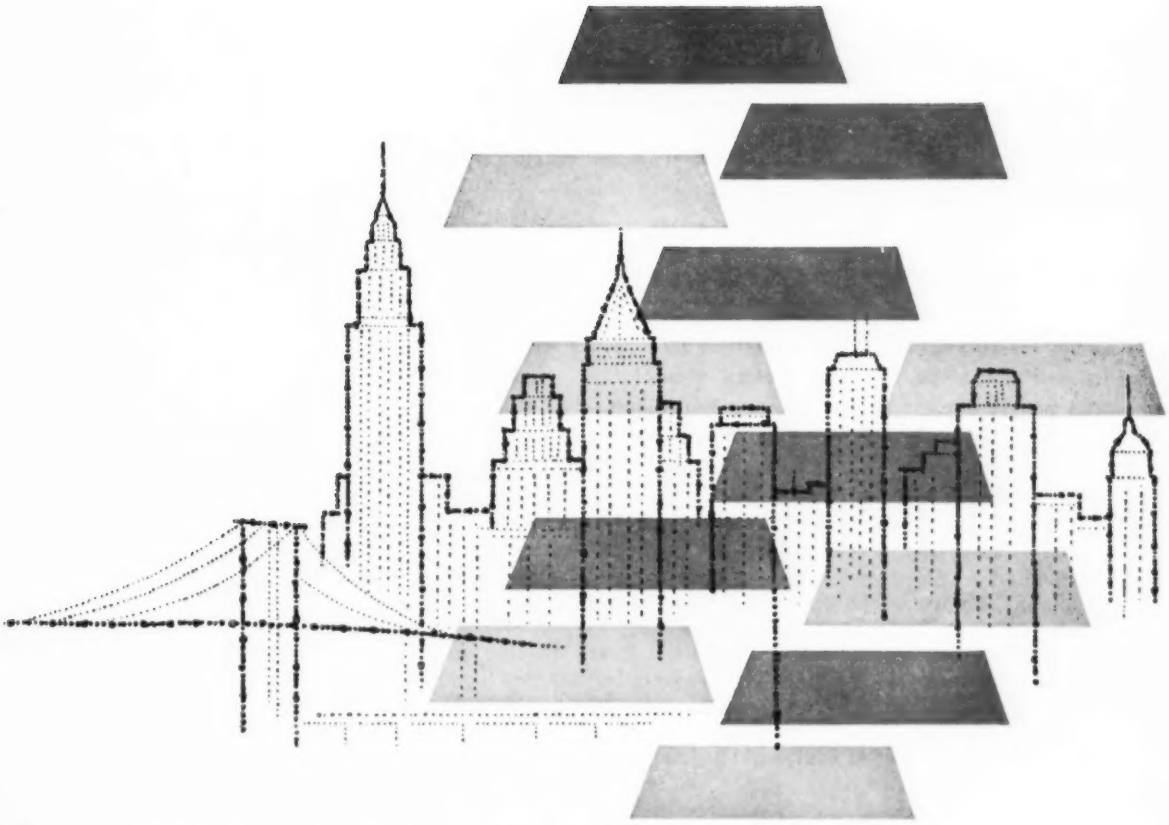

The world's finest alloys are melted in Ajax induction furnaces

Mixing metals can present some awesome complications.

Dispersing lightweight aluminum through a nickel-cobalt solution, for example. Or recovering every grain of gold from a minting operation. Or salvaging the valuable chromium trapped in stainless steel scrap.

Surprisingly enough, all three of these problems are related. For they share a common solution . . . the unique features of an Ajax-Northrup induction furnace. This furnace "stirs" its molten charge, dispersing every element evenly through the melt regardless of density . . . combines fast melting with extremely accurate temperature control . . . prevents contamination . . . makes 100% scrap recovery an everyday reality.

That's why so many important alloys owe their very existence to Ajax induction furnaces. That's why, whether the charge is a new super alloy . . . bronze . . . or even gold . . . if the results are important, the furnace is Ajax-Northrup.

The fascinating history of induction heating and its unique application to melting, forging, and heating operations throughout industry are told in a new book. Write Ajax Electrothermic Corporation, Trenton 5, New Jersey for your copy.

Induction heating melting

AJAX

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ASSOCIATED COMPANIES: AJAX ELECTRIC COMPANY—AJAX ENGINEERING CORPORATION

AUTOMOTIVE ASSEMBLY LINE

How Thunderbird Scores on Road Test

The 1957 "T-Bird" hugs the road, corners beautifully at high speeds, and gives the driver a feeling of security . . . Rides softer than any true sports car . . . Body changes are minor—By T. L. Carry.

◆ AS A RULE, this column is aimed at new processes and equipment being used by the automobile industry, rather than at cars themselves.

But like anything else, a change of pace never hurt anybody, so we thought it might not be a bad idea to actually test drive a few of the more specialized cars and report the reaction.

For a starter we went out to the Ford Motor Co. to drive a 1957 Thunderbird.

This year's T-Bird (as it is known in the hot rod set) doesn't look too much different from its predecessor but there have been several changes made.

Check The Differences . . . The continental tire which was on the '56 model has been moved inside the trunk for better weight distribution. Rear quarter panel fenders have been canted outward and the front grille has been enlarged for better cooling.

The car's suspension is basically the same as that used on the big Ford. It has ball joints and coil springs in the front and conventional leaf springs in the back. It has 14-in. wheels. The wheelbase is 102 in. Overall length is 181.4 and height is just a trifle over 51 in.

Three engine options are available. One V-8 with a 2-barrel carburetor and a 3-speed transmission develops 212 hp. The second with a 4-barrel carburetor and Fordomatic is rated at 245 hp and the third has two 4-barrel carburetors that will develop 270 hp.

The car we drove was equipped with the 245 hp engine.

How Pros Do It . . . When a professional driver tests a car, he is mainly interested in three things: ride, performance and handling.

There is no real accepted definition for ride because it is such a subjective thing. Two experts can take the same type of ride over the same road and their reaction will be as different as night and day.

Performance, however, is generally considered as the car's ability to accelerate and handling is the way that it steers.

It was impossible to go out on Ford's test track the day we drove the car because the company was conducting secret tests for its new Edsel.

But driving over ordinary roads is perhaps a better test.

So Soft, So Firm . . . Ford does not refer to the T-Bird as a sport car. The company prefers to call it a personal automobile. This is because the ride is softer than one you would experience in a true sport car, but at the same time it is firm.

The Thunderbird is not the best riding car on the road and it isn't

Plodding Toward Federal Safety Laws

After studying the facts for half a year, a congressional subcommittee investigating highway accidents came up with a conclusion that everybody knew right along:

"Excessive speed is the cause of many deaths and injuries."

But this congressional move to investigate the staggering death toll indicates that some measure of highway safety enforcement might be forthcoming.

In its report, the group headed by Rep. Roberts, D., Ala., makes the following recommendations:

All traffic signs, signals and markings be standardized nationally.

Motor vehicle inspection be made more rigid.

Stricter emphasis on driver training and licensing.

Broader research into human factors contributing to traffic mishaps and accidents.

Better law enforcement, and administration of traffic justice.

Motor vehicle design should emphasize safety, rather than speed.

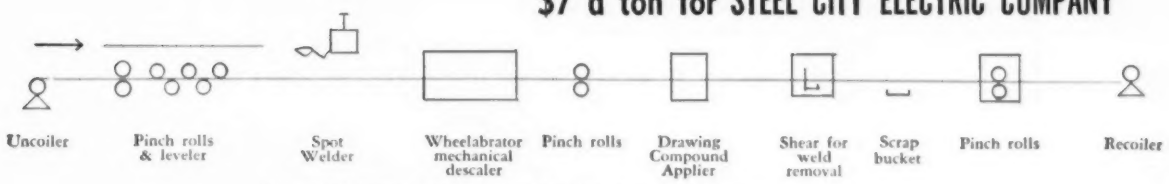
Advertising campaigns should plug safety, not horsepower.

The lawmakers commended automakers who already have adopted such safety features as improved headlights, safer door latches, dish-type steering wheels, padded dashboards and safety belts, to name a few examples.

Only a part of the broad field of traffic safety has been surveyed, the subcommittee points out, and recommends that the investigation be continued.

How much would you SAVE in one year by *cutting steel costs* $7 a ton?

Wheelabrator® Mechanical Descaling saves $7 a ton for STEEL CITY ELECTRIC COMPANY



Schematic Diagram: Strip Cleaning Line, Steel City Electric Company

Only one man is required to operate the mechanical descaling line at Steel City Electric Co.

Strip is Wheelabrated prior to stamping and electrogalvanizing of electrical products.

Cleaning hot rolled 1010 steel strip in a Wheelabrator mechanical descaler for $3 a ton has brought big savings for Steel City Electric Company of Pittsburgh, which was paying a premium of $10 a ton for pickled steel from the mill. The $3 figure includes the operating cost for all equipment in the cleaning line. Cleaning strip up to 48" wide and from .060" to .1875" thick, the Wheelabrator descaler cleans an average of 50 tons of steel in an 8-hour day — a potential saving of $350 in steel costs every 8 hours. Don't let saving like this pass you by — investigate Wheelabrator mechanical descaling today. Find out how it can be tailored to your specific needs.

For more information on Wheelabrator savings for steel processors, write today for Bulletin 128D.

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U. S. Automotive Production

WEEK ENDING	CARS	TRUCKS
Jan. 12, 1957*	146,527	19,574
Jan. 5, 1957	91,130	11,087
Jan. 14, 1956	150,030	24,712
Jan. 7, 1956	125,245	19,103
TO DATE 1957	237,657	30,661
TO DATE 1956	275,275	43,815

*Estimated. Source: *Ward's Reports*

supposed to be. The springs have been calibrated so that the driver always has the impression that he is in control of the car even at high speeds.

We didn't pull any acceleration tests but the Thunderbird has been known to go from a standstill to 60 mph in less than 8 sec. The fastest we dared to drive was in the vicinity of 90 mph and the tachometer indicated that the engine was turning at about 3500 rpm.

Even at this speed there was still plenty of room left on the accelerator pedal which indicates that a speed of 120 mph could have been obtained without any strain.

You Wear It . . . Handling the car is a real sensation. At first, there was a tendency to oversteer but this was mainly due to power steering. Once we had the feel of the car, there was no stopping us.

The Thunderbird, because of its dimensions, has a very low center of gravity. This actually gives the driver a sense of security even at high speeds. As one Ford engineer put it, "You don't get into a Thunderbird, you put it on."

Overall weight of the car we drove is approximately 3400 lb. This is distributed almost equally over front and rear of the car.

Rambler Injects Power

American Motors Corp. takes exception to recent remarks made about its Rambler Rebel which will be equipped with fuel injection when it is available in the spring.

The addition of fuel injection, the company says, doesn't put it in bed with the Big Three.

AMC says that it is the only company that is combining what it calls the compactness of the Rambler with the advantages of fuel injection.

The company argues that heavier and bigger cars require more hp to operate. In the case of the Rambler, the customer has a choice of more economy or better performance and adds that the Big Three is handicapped because of the size and weight factor.

With the addition of an optional fuel injection system, AMC claims that it is rounding out its hand in regard to outflanking its competitors. The company says that its product approach is unique because it is the only producer that is running the size-power-economy gamut.

The Big Race:

Ford pulls ahead. Chevrolet halts 1958 tooling.

Word in the Motor City is that Chevrolet has temporarily halted all tooling on its 1958 model.

This in turn has led to a rash of rumors and speculation, because it's pretty late in the game to stop tooling on '58 models.

Most generally accepted reason for the halt is that the GM division is worried about its number one competitor, Ford.

So far in this model year, Ford is ahead of Chevrolet in production. Pundits in Detroit blame this on the fact that Chevvy's car this year doesn't look as good as Ford's.

But Chevrolet is stuck with its 1957 model and will do the best it can with it. In the meantime, it is making big changes in its 1958 car to make sure that such a situation doesn't arise again.

Ford Div. executives are currently jumping up and down with joy.

Over 500,000 cars have been produced in a little over 3 months since the car was introduced. The company's Ford assembly plants have been working on heavy overtime schedules because of a heavy dealer demand for the cars.

R. S. McNamara, division general manager, says that Ford produced over $1 billion worth of 1957 cars last year. Assembly plants have been operating up to 35 pct above regular time.

THE BULL OF THE WOODS — By J. R. Williams

HAVE HIM MAKE A NEW SHAFT EXACTLY LIKE TH' OLD ONE--BUT TELL HIM NOT TO BEND IT LIKE TH' OLD ONE!
TH' BULL'S NEVER GOT OVER TH' TIME HE TOLD A GUY TO MAKE A NEW SHAFT EXACTLY LIKE THE OLD ONE AN' HE DID--GROOVES, DENTS, WORN SPOTS AN' EVERYTHING!
I'LL BET THAT'S ONE TIME THAT A FOREMAN DON'T MIND TH' BIG BOY GOIN' OVER HIS HEAD AN' TELLIN' TH' GUY HIS-SELF!
THE WRECK
1-16 JR WILLIAMS
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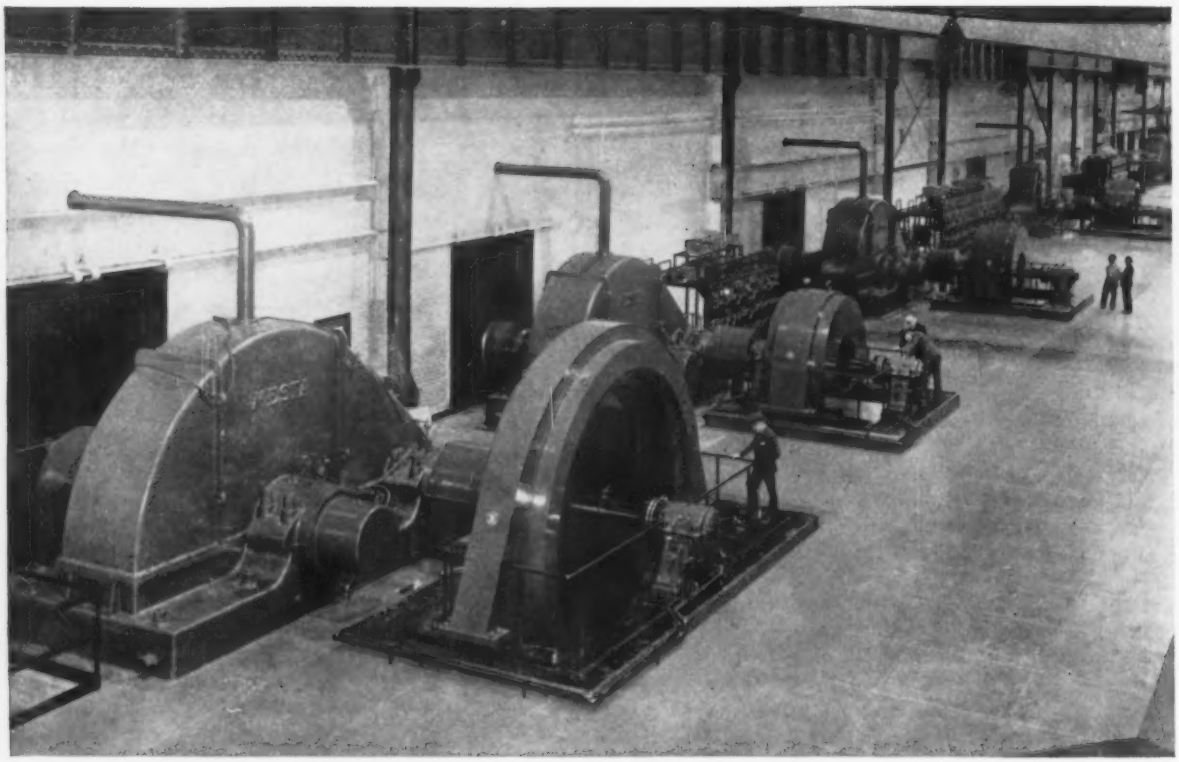

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THE RESULT, of course, is smoother operation, longer lasting protection, extended life, and lower maintenance costs.

Texaco Meropa Lubricant is also notable for its long-lasting extreme pressure properties, which cushion shock and stand up under heavy duty steady loads far in excess of manufacturers' requirements. In addition, *Texaco Meropa Lubricant* resists thickening, does not foam, does not separate and protects metal from corrosion.

For roll stand circulating systems, use *Texaco Regal Oil*. It resists oxidation and sludging, keeps systems clean, roll neck bearings protected.

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TUNE IN . . . METROPOLITAN OPERA RADIO BROADCASTS EVERY SATURDAY AFTERNOON

A New Wage Spiral Is In The Making

If $1 per hour minimum wage goes through, a chain reaction will set in . . . Differentials will be maintained throughout entire wage structure . . . Little opposition—By G. H. Baker.

◆ ANOTHER ROUND of wage increases is in the making. Here's what's happening:

The Eisenhower Administration wants Congress to rewrite the federal minimum wage law so as to make the $1-per-hour minimum apply to everybody, not just certain groups as is now the case.

There's a good chance that this request will be written into law. If so, unions will seek to preserve the customary pay differentials.

Example: . . . Semi-skilled workers, finding that unskilled workers are earning nearly as much, will demand "equalization" (meaning, maintain the same spread between hourly rates for unskilled workers and semiskilled workers).

Next, skilled workers demand adjustment of the narrowing gap between their wage rates and those of the unskilled groups.

It's a chain reaction, and when it's all over, every category of worker will have received an "adjusted" increase in his hourly pay rate. Overall effect will be to upgrade all workers, but the relationship between the pay scales for different jobs will remain the same.

Pass It On . . . As the federal minimum wage law now stands, about 20,000,000 workers—mostly in the retail and service trades, are paid less than $1 per hour. Opposition from employers in these fields has been melting away in the past two years. For management knows that in times of boom business, there will be little difficulty in passing along the cost increases to customers.

The consumer will be called upon to make up the difference, of course.

Probe Labor Rackets

Fresh reports of racketeering by certain labor officials bring new Senate demands for investigations. Two different Senate committees are clamoring for authority to look into misuse of dues money and other illegal goings-on within unions.

Senators McClellan, D., Ark., and Ives, R., N. Y., each is asking the Senate to put up $250,000 for a union investigation. And both emphasize that they will avoid anything that smacks of "labor-baiting."

The huge national road-building program that is now getting underway offers all kinds of opportunities for labor racketeers, Senator McClellan points out. He warns construction contractors against making any questionable deals with labor racketeers. In response, the AFL-CIO is cracking down on corruption.

How John L. Looks at Congress

John L. Lewis doesn't expect too much from Congress—from his point of view.

The United Mine Workers Journal, official union bulletin board for the fiery labor leader, predicts that Dixiecrats and conservative Republicans will freeze out pro-labor legislation.

"Rep. Sam Rayburn and Sen. Lyndon Johnson are not going to do anything for organized labor because they don't have to," the UMW Journal says.

Here's how the aging, but still formidable, head of the Mineworkers sees the legislative picture in the next congress:

Taft-Hartley Act—No repeal.

Union pension and welfare funds—Federal inspection system will be set up. Mr. Lewis is opposed to this, although his UMW fund is one of the cleanest.

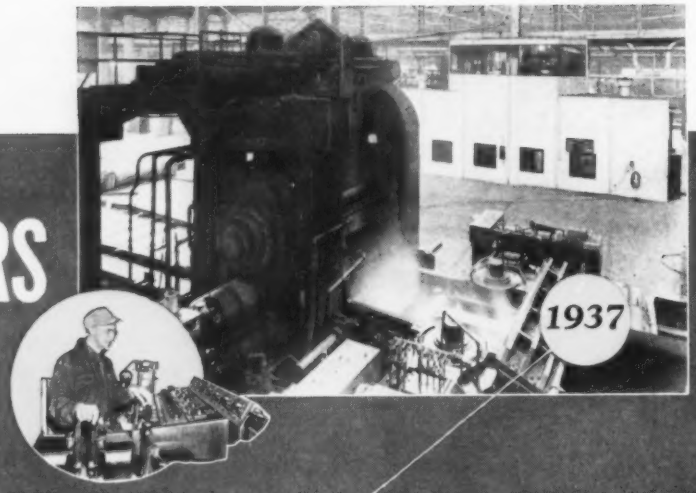
Military spending and foreign aid—No cuts in sight. ("State Dept. and military will cry 'wolf' once again, and Congress will be so frightened it will do whatever they want.")

Atomic energy—Atomic energy will stand on its own in competition with other fuels. Government subsidy to development of atomic energy will be opposed by miners and industry.

Tax cuts—None.

20 YEARS OF EC&M DESIGN LEADERSHIP!

IN AUTOMATIC-POSITIONING SCREWDOWN CONTROL



20 YEARS AGO, EC&M Automatic-Positioning Screwdown Control was installed in this mill. It has been doing an outstanding job ever since.

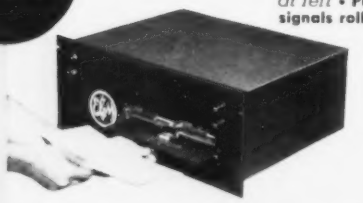
Since then, this same basic EC&M system has been installed in nearly 50 other mills—including blooming mills, billet mills, beam mills, plate mills and reversing roughers ahead of hot strip mills.

Now, this same proven system has been expanded to provide programming either by punched cards or by slider panels—for new or existing installations, operated from either constant or adjustable voltage.

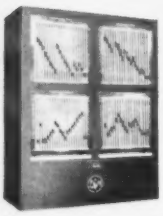
1957

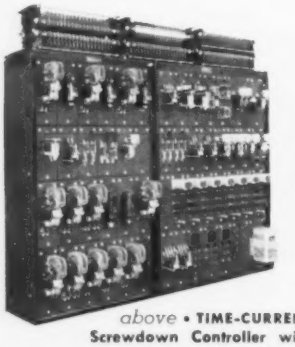
PROGRAMMING NOW AVAILABLE BY PUNCHED CARDS OR SLIDER PANELS

at left • **Punched Card Reader automatically signals roll setting for each pass**



at right • **Slider Panel provides roll settings for 2 complete schedules. Pistol grip switch provides immediate transfer from one to the other**





above • **TIME-CURRENT Screwdown Controller with Magnetic Amplifier Control and Relay Panel**

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Ability to change from automatic to manual and back again, instantly available to the roller.

EC&M system is direct reading. No coding and de-coding requiring multiplicity of relays.

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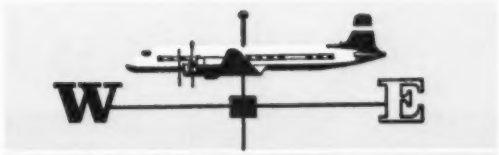


WEST COAST REPORT

Growth Takes No Vacation in Arizona

Metalworking firms can find state has healthy industrial climate . . . A major distribution center, its advantages include good labor pool and favorable tax setup . . . Electronics, mining pace boom—By R. R. Kay.

◆ ARIZONA to vacationers means the Grand Canyon, Painted Desert, and Apache Trail. But to metalworking men and management it should mean impressive population and industrial growth and a fast-developing major distribution center for the rich markets in southwestern U. S. and Mexico.

Arizona's economic growth rate ranks near the top for that of the country. It's done so for five years, with metalworking playing a major role. New people and new plants continue to bring in and create new wealth. Doubling its population in 15 years—now over a million—Arizona still has them coming in 40,000 a year.

Since 1950, new home starts have hit a 20,000-per-year clip; new businesses, 1000 per year.

Wealth from the Deep . . . Mining is still kingpin in the economy. Arizona copper mines produced about a billion pounds last year—almost 55 pct of the U. S. total. That's a 10 pct jump over 1955.

Discovery of uranium in the north and central parts of the state touched off hectic activity. Today, Arizona's mineral miners spend some $4 million per year for equipment. They buy much of it in southern California.

Five Big Reasons . . . Here's a check list of Arizona's main attractions:

(1) Labor pool. The supply of skilled and semi-skilled workers is good. It can take care of all announced plans with plenty left over. However, some specialized engineering help is short in the aircraft and electronics firms.

(2) Distribution center. Twenty million people live within 750 miles of Phoenix. Therefore, more and more big national firms are setting up manufacturing, warehousing, and distribution facilities to serve their customers in southwestern U. S. and northern Mexico.

They include: Cummins Diesel, General Electric, Pittsburgh Plate Glass, U. S. Rubber, Westinghouse Electric.

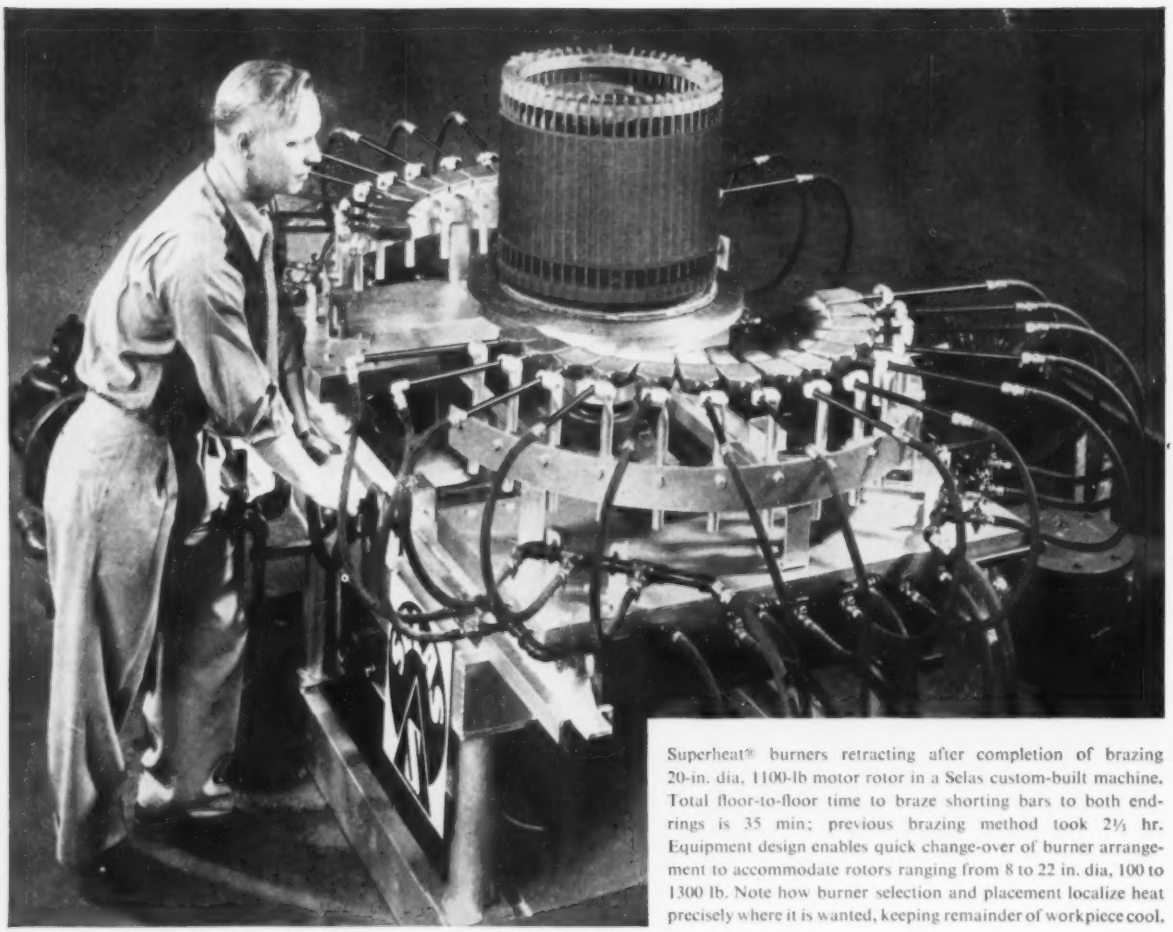
(3) Location. It's only a two-hour plane hop from the industrial center at Phoenix to California's missile and aircraft plants.

(4) Climate. The area's healthful benefits have been well publicized. But for industrialists, they could mean less absenteeism, lower building and heating costs, fewer humidity problems in manufacturing.

(5) Tax laws. There's no inventory tax on raw materials, parts, or finished products. This means no tax on goods stored for shipment to other states. Recently, the state rubbed out its tax on Federal sales. It's a move designed to invite in more government suppliers.

TEST FACILITIES such as the $5 million plant of AiResearch Mfg. Co. of Arizona in the foreground and production centers like those of Garrett Corp. in the background help explain Arizona's favorable business climate.

Selas-Brazing Saves 1¾ Hours in Motor Production



Superheat® burners retracting after completion of brazing 20-in. dia, 1100-lb motor rotor in a Selas custom-built machine. Total floor-to-floor time to braze shorting bars to both end-rings is 35 min; previous brazing method took 2½ hr. Equipment design enables quick change-over of burner arrangement to accommodate rotors ranging from 8 to 22 in. dia, 100 to 1300 lb. Note how burner selection and placement localize heat precisely where it is wanted, keeping remainder of workpiece cool.

This Selas Method of brazing rotors is currently employed by several large motor manufacturers . . . to accommodate a variety of diameters . . . with speedy change-over resulting from easily-adjusted gas-air burners. Highheat transfer is achieved with low-cost city gas, no bottled oxygen is required. Brazing time is cut as much as one and three-quarter hours on large rotors, proportionately on smaller sizes.

In this, and in all Selas-Brazing machines, individual burner controls provide precise temperatures, specific heat patterns. Any acceptable filler metal (both copper and silver alloy are used with the machine illustrated) may be hand-fed or preplaced. Reproducible uniformity, not possible with other methods, is achieved. Only simple labor skills are needed to meet modern production requirements with these versatile, compact, space-saving brazing machines.

Selas-Brazing machines are custom-built to meet specific workpiece demands. Selas engineers welcome the challenge to design and build equipment to serve your joining needs. For more information on how Selas-Brazing is utilized in a wide range of metal-joining applications send for new bulletin No. 11—"Production Brazing and Soldering" and reprint "Mechanized Heating Puts Brazing on the Production Line."

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Chipless Machining Gains Support

Aircraft industry is getting a lot of experience in this new cold-forming technique . . . One process uses a lathe-like machine equipped with rollers . . . Economical for small job lots—By *E. J. Egan, Jr.*

◆ AUTOMATED—or, if you will, "integrated" — machining operations owe much of their present efficiency to the automobile makers.

In much the same manner, it now seems that so-called "chipless" machining will find its champion to be the aviation industry.

Rollers Replace Bits . . . Quietly, but very steadily, firms doing aircraft and missile work have been learning how to use some of the newer cold forming techniques. One, in particular, has apparently made a big hit.

This is a process that uses a lathe-like machine. At least it has a headstock, a spindle, a faceplate and a tailstock. But in place of metal cutting tools, it's equipped with two hardened steel rollers, one in front of the machine bed and one behind it.

Both rollers are mounted so that they can be fed either crosswise or longitudinally. In this manner they can literally "flow" a flat metal blank or a simple preform to a conical, curvilinear or tubular shape. The guide for this flowing action is a relatively inexpensive mandrel that is attached to the lathe faceplate and rotates with it. Of course, the blank, which is clamped firmly to the mandrel by the tailstock ram, rotates also.

Small-Lot Economy . . . It's amazing how many conical, curvilinear, hemispherical and tubular parts there are in airplanes, jet engines and missiles. The situation is further complicated by the variety of sizes and materials that are specified. Quantities needed are usually well below mass-production figures, too. This makes the already difficult task of producing them by conventional press-forming or machining methods even tougher—and more costly.

So the people who make things that fly through the air like the idea of these roller-forming lathes. They like the fact that the cold-formed parts are stronger, and that mandrels can be made more cheaply and quickly than big sets of forming dies.

They've picked up a lot of experience in forming aluminum, mild steel, titanium and stainless with these machines. But they've been hampered somewhat by the diameter and thickness of the blanks they could tackle. With any of these metals, limiting diameter of flat blank or preform has been 42 in. Thickness limit, with stainless for example, has been about ⅝ in.

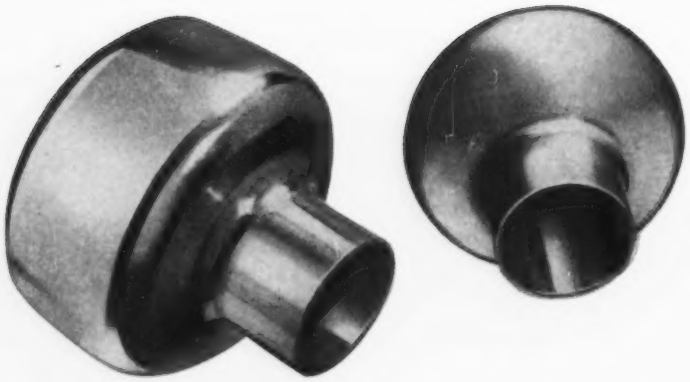
"I hope 1957 won't be as unpredictable as 1956, Clyde!"

Bigger Machines Coming . . . So the plane makers want to go a step further. The Aircraft Industries Assn., working with equipment builders and the military, has approved specifications for a bigger and better roll forming machine. It's supposed to be capable of cold flowing a 60-in. diam, 1-in. thick stainless blank to the aforementioned shapes, and probably to lengths of 6 to 7 ft and more.

Successful operation of such a machine will turn another big spotlight on the whole idea of cold, chipless forming of metals. Then, just as automation has spread out from Detroit to other areas of metalworking, so should the chipless idea take firmer root in other than aviation fields where similar economies can be gained by the newer techniques.

This is not to say that chip making will ever become extinct. After all, even a "chipless" forming machine, plus its rollers and mandrels, has to be built with conventional cutting and grinding tools.

The heartening thing is that both processes have found willing sponsors. Because of this, all segments of the metalworking industry can profit by what the automotive and aviation pioneers have learned without having to pay for the initial, expensive experimentation involved.



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The one-piece door knobs shown are drawn from a single blank of Revere Brass Strip, presenting an attractively smooth, unbroken surface without the need for seams or welds.

Because they are made by a unique procedure the manufacturer tells us that the brass must stand up under mighty rugged going, and that to produce the quality knobs they do, at an economical production level, the brass they use must have:

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3. *Consistently correct grain structure to insure a smooth, flaw-free surface on the finished knobs.*

The manufacturer also tells us that Revere Brass Strip has been filling that bill, with utmost satisfaction, for some time.

Revere Brass Strip may be able to help *you* make a better product at less cost. You'll never know until you talk it over with one of our TA's (Technical Advisor). There's no obligation, of course. And such a discussion could save you a substantial sum of money. Such has been the case many, many times.

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The Iron Age

SALUTES

William H. Worrilow **President and co-founder of Lebanon Steel Foundry, he learned the hard facts of life at an early age; went on to become one of industry's most respected foundrymen. He was among the first to use electric furnaces.**

Even as a boy in Chester, Pa., William Henry Worrilow was willing to give a fellow the benefit of the doubt. When his first employer failed to ante up $2 for his first week's pay, the boy stayed on.

He stayed on the second week and the third, but after three payless months, the economics of the situation just wasn't working out. Young William found another job as a clerk with the Johnston Railroad Frog and Switch Co. at $3 a week, cash on the barrelhead.

Many paydays have passed since Mr. Worrilow had his first disillusioning experience in the business world. He learned early that all was not a bed of roses, yet he never lost faith in the opportunities the business world had to offer.

Today, 65 years later, he is president of Lebanon Steel Foundry, Lebanon, Pa., a director of Armstrong Cork Co., past president of the Steel Founders Society of America, the Alloy Casting Assn., the Alloy Casting Institute, and the Philadelphia Post, American Ordnance Assn. In 1948 he received the Distinguished Service Award from the American Society For Metals.

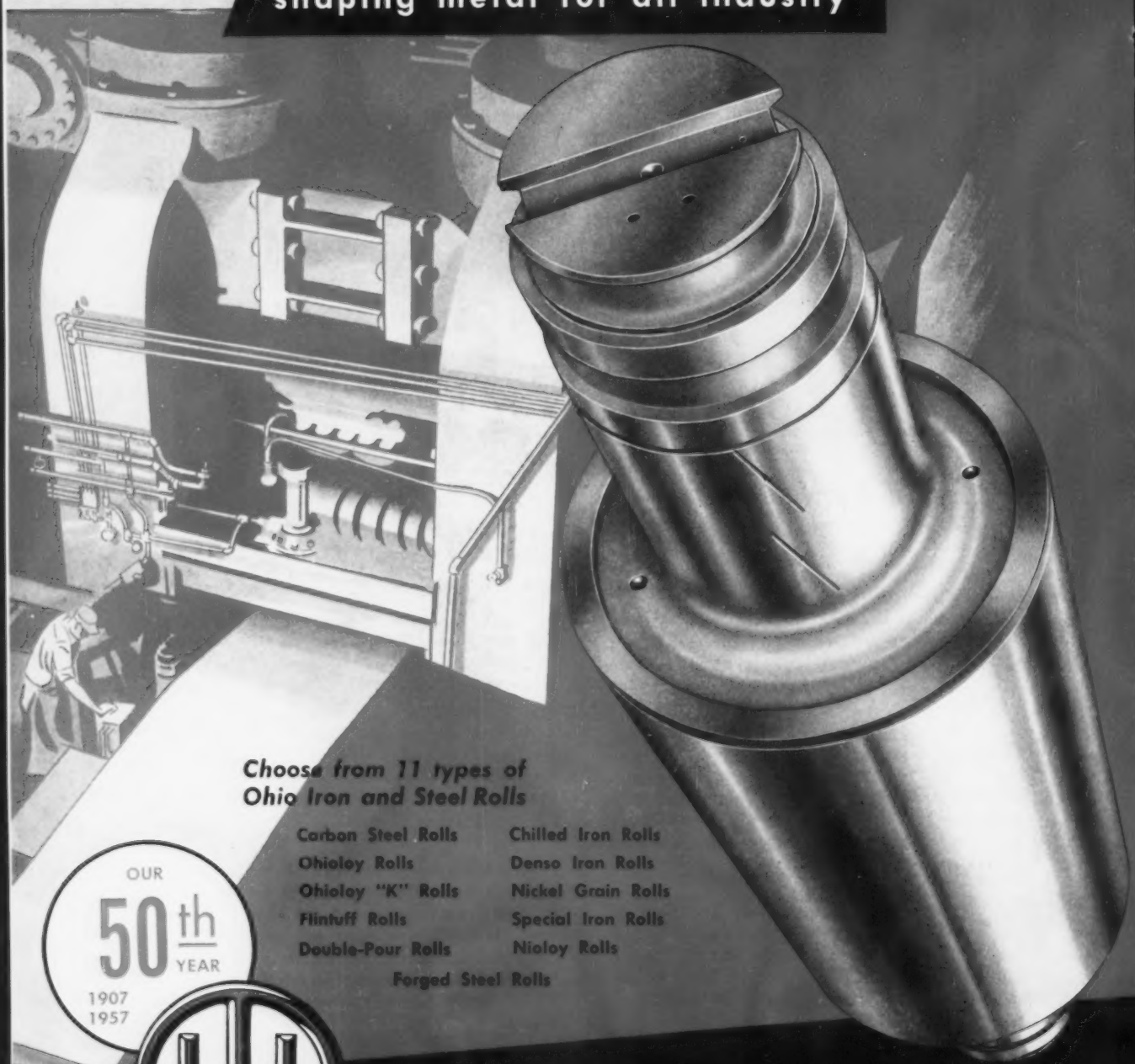
As you might suspect, a lot of hard work went into the years between. When he came to Lebanon in 1907, as sales manager for Lebanon Steel Casting Co., he met his future partner, the late Thomas S. Quinn.

Mr. Worrilow and Mr. Quinn went into business for themselves in 1911. Their foundry consisted of a wooden shed and 20 workers. They were the first, in 1915, to use electric furnaces commercially in the U. S. And in 1938, they developed a cast armor that set the pattern for U. S. Army tank construction during World War II.

Today, Mr. Worrilow's foundry covers a 37-acre tract and employs 1500—all of whom, you can bet, get paid on time.

Ohio Rolls

shaping metal for all industry



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- Flintuff Rolls
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The Iron Age INTRODUCES

L. M. Ricketts, elected president and treasurer, **Poole Foundry & Machine Co.,** Woodbury, Baltimore, Md. **L. M. Ricketts, Jr.,** elected executive vice president and asst. treasurer; **R. D. Ricketts,** elected secretary; **G. N. Casciero,** named asst. secretary; **A. E. Swanson,** elected vice president, engineering.

John W. Little, elected president, **Goslin-Birmingham Manufacturing Co.,** Birmingham, Ala.

Hugh V. Allison, president and general manager, Allison Div., **American Chain & Cable Co., Inc.,** Bridgeport, has been named general manager of ACCO's Campbell Machine Div.

Edward E. Schwegler, elected vice president, **The New Jersey Zinc Co.,** New York.

Thomas K. McCarthy, elected vice president and counsel, **Kaiser Aluminum & Chemical Corp.,** Oakland, Calif.

J. T. Bachman, elected vice president and general manager, sales, **The Cold Metal Products Co.,** Youngstown, O.; **E. V. Mort,** appointed plant manager, Youngstown plant; **E. B. Whittemore,** appointed asst. general manager, sales; **J. R. Colwes,** named manager, Production Planning and Scheduling Dept.; **E. J. Moorhead,** appointed manager, Order Dept.

Clarence J. Schilling, elected vice president and chief engineer, **Air Products, Inc.,** Allentown, Pa.; **Edward Donley,** elected vice president and general manager.

Merrill L. Heald, appointed general attorney, Law Dept., **U. S. Steel Corp.,** Pittsburgh.

Ernest F. Donatic, named general superintendent, **Kaiser Steel Plant,** Fontana, Calif.; **James P. Williams,** appointed manager, engineering and planning.

S. T. Mackenzie, elected vice president, Sales Dept., Boiler Div., **The Babcock & Wilcox Co.**

Robert R. Elsasser, named superintendent, Gambrinus Plant Tube Mills, **The Timken Roller Bearing Co.,** Canton, O.; **George Messer,** named superintendent, Finishing Depts., Tube Div.

A. C. Brown, Jr., named vice president, eastern region, **Air Reduction Sales Co.,** New York; **D. D. Spoor,** appointed vice president, midwestern region, Chicago; **J. J. Lincoln, Jr.,** named vice president, southern region, Houston, Tex.

Truman H. Kennedy, appointed general superintendent, Lorain, O., Works, National Tube Div., **U. S. Steel Corp.;** Louis F. Sattele, named general superintendent, National Works, McKeesport, Pa.

GUY T. AVERY, elected president and chief administration officer, Acme Steel Co.

DR. CLARENCE ZENER, appointed director, Westinghouse Research Laboratories.

HOWARD M. WINTERSON, named vice president, Blaw-Knox Co., Pittsburgh.

J. E. McWILLIAMS, named vice president, Blaw-Knox Co., Pittsburgh.

LESTER C. SMITH, elected president, The Spencer Turbine Co., Hartford, Conn.

R. A. BRACKETT, elected executive vice president, The Spencer Turbine Co., Hartford, Conn.

ROBERT URQUHART, named executive asst. to vice president, operations, National Tube Div., U. S. Steel Corp.

William W. Deal, named manager, sales, western area, American Steel & Wire Div., **U. S. Steel Corp.**

Reinhold Schempp, named manager, Sanderson-Halcomb Works, Syracuse, N. Y., **Crucible Steel Co. of America; S. A. Fronek** will head Parks Works, Pittsburgh, Pa.

Thomas E. Snyder, appointed manager, Detroit Warehouse, **Jones & Laughlin Steel Warehouse Div.; Frank M. Harbison,** appointed manager, New Orleans Warehouse.

Quentin M. Bloom, named manager, Furnace & Kiln Div., **Selas Corp. of America,** Dresher, Pa.; **Charles A. McFadden,** named manager, General Industry Div.

Harry L. Bishop, Jr., and **Sundaresan Ramachandran,** named research advisors, melting section, Research Lab., Brackenridge, Pa., **Allegheny Ludlum Steel Corp.**

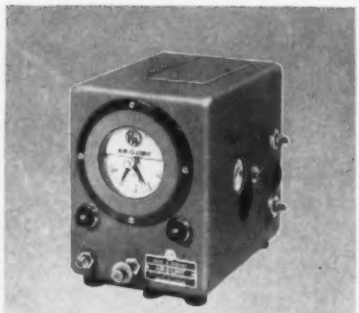
Charles P. Greenlee, named manager, Detroit District Sales Dept., American Steel & Wire Div., **U. S. Steel Corp.; E. A. Murray,** named district manager, sales, Chicago.

James K. McLaughlin, appointed manager, sales, low frequency induction heaters, **Magnethermic Corp.,** Youngstown, O.

Alfred J. Olson, named general sales manager, Chicago plant, **Joseph T. Ryerson & Son, Inc.; L. Paul Lee,** named manager, stainless steel sales, Milwaukee plant.

Paul M. Brister, appointed manager, engineering design section, Manufacturing Engineering Dept., **The Babcock & Wilcox Co.,** Barberton, O., Works; **William D. Stevens,** named engineering dept. coordinator.

Russell W. Knode, named general manager, sales, Mining Div., **The Jeffrey Manufacturing Co.,** Columbus, O.; **Carl G. Schilbe,** named district manager, Salt Lake City.



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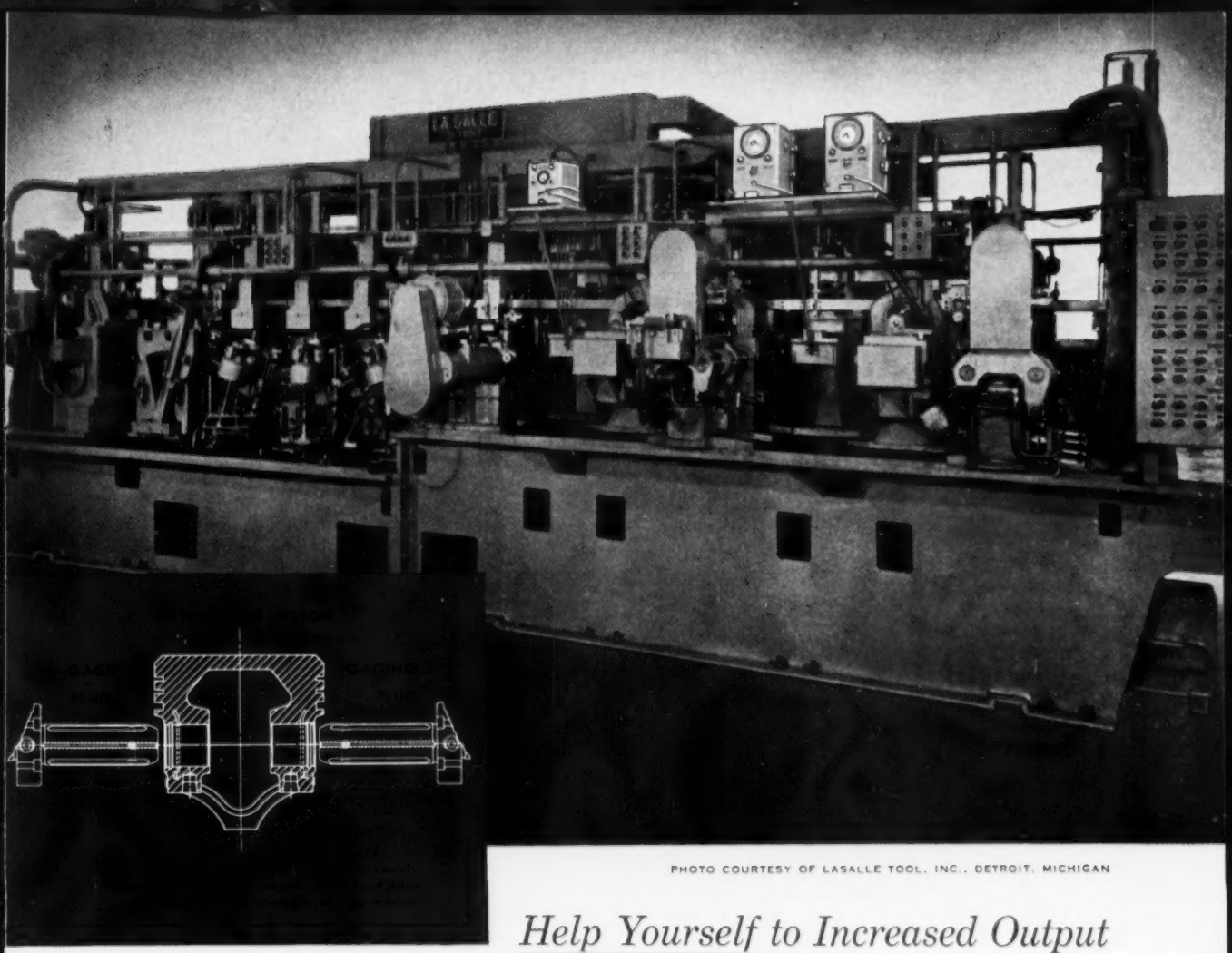
BASIC 2-LIMIT UNIT . . . indicates high and low tolerances. Suitable for sorting and other "yes-or-no" control applications.

3-LIMIT UNIT . . . especially suited for grinding and similar operations. Indicates or automatically controls such conditions as: "Fast Feed," "Slow Feed," and "Spark-Out."

4-LIMIT UNIT . . . similar to 3-Limit Unit, but provides greater control scope. Indicates or controls such conditions as: "Approach High Limit," "High Limit," "Approach Low Limit" and "Low Limit."



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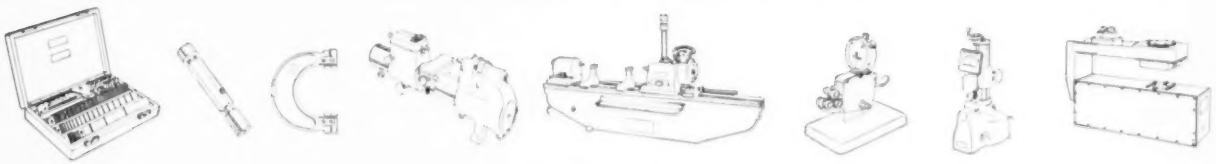
For example, these P&W Packaged Units made it easy to provide automatic on-machine gaging for this special, high-speed automotive piston machine produced by LaSalle Tool, Inc. Two P&W Air-O-Limit Carbide Gage Plugs are arranged to check the ID of both wrist pin bores on the pistons automatically. Lights on the P&W Control Units signal the operator if tolerances are exceeded. A second set of gage plugs similarly checks bores for the presence of snap ring grooves. If desired, control units can be arranged to shut down the machine automatically when an imperfect part is detected. Whatever *your* requirements, P&W can supply gaging equipment exactly right for the job.

For complete information, write to Pratt & Whitney Company, Incorporated, 10 Charter Oak Boulevard, West Hartford, Connecticut.



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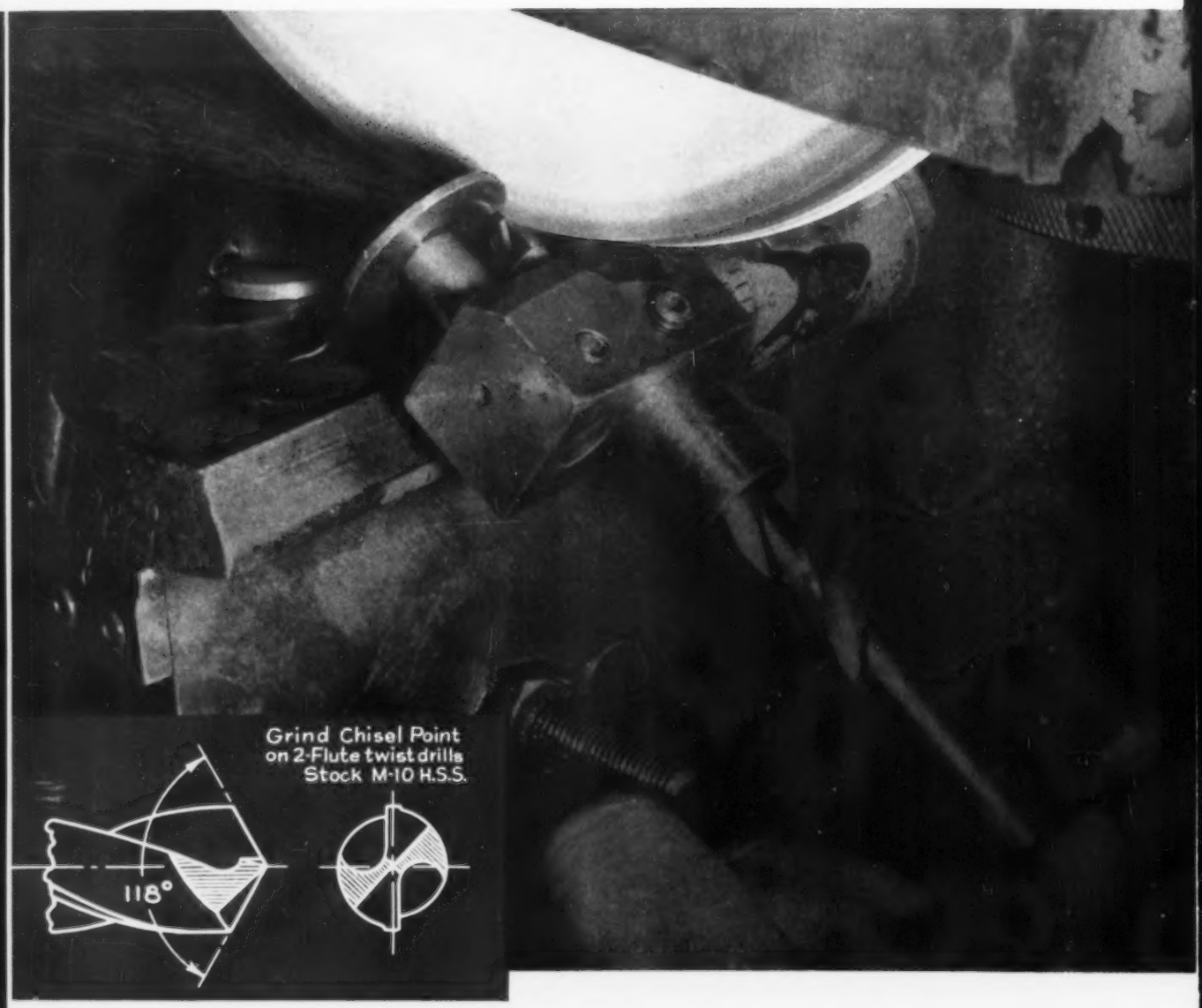
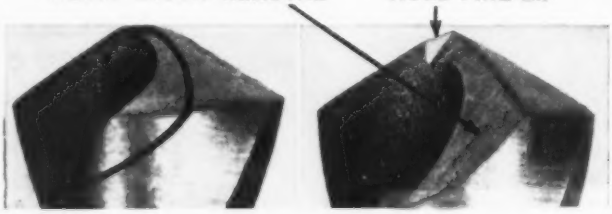


A GRINDING PROGRESS REPORT

Bay State Engineer Finds Way to Triple Production on Chisel Point Grinder

Grinding a "chisel point" on the business end of a twist drill makes it start faster and drill better in hard materials. It's more economical to grind each side of the "chisel" in one cut, as illustrated.

In practice, however, grinding wheels hard enough to hold their corner while cutting the sharp lip, burned the steel in the wide area near the land of the drill. Conversely, wheels soft enough for cool grinding on the land lost their corner rapidly in cutting the lip. In either case, frequent dressing of the wheel was necessary. Because of this, expensive overtime shifts were being worked in an attempt to meet production schedules. Even so, production lagged and rejections were high when Bay State was called in.



Bob Belmont, with 14 years abrasive engineering experience, quickly saw chisel-point grinding as two jobs in one.

Two jobs are done simultaneously with this wheel having two layers of different abrasives. Fine-hard side grinds the drill tip; coarser-softer side makes heavy cut on the land.

Bay State District Manager Bob Belmont saw this drill grinding problem as it really was . . . two distinctly different grinding tasks being done at the same time. To him, here was a natural spot for the "sandwich" wheel, really two wheels in one, with two different layers of abrasives, each having the exact specifications needed for its part of the job. The "specs" worked out for this actual case show the following important differences:

1. The side used for forming the sharp chisel lip has the highly refined 9A (White) Tool Grinding abrasive, a fine grit size (220), and a "hard" bond strength (P grade).

2. The side taking the deep cut on the broad area of the drill land has the less friable 8A abrasive, a relatively coarse grit size (150), and is two full letter grades "softer", (N grade).

With this sandwich wheel, chisel point production rose three times and even more, depending on drill size. In every case, this was more than enough to keep production going smoothly *without* overtime, and with excellent quality of points.

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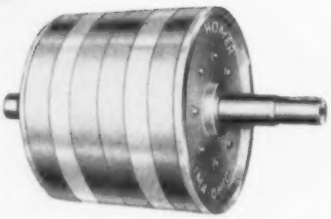

Homer Permanent Magnetic Pulleys in belt conveying systems cut costs in a multitude of metalworking operations. They automatically remove tramp iron from coke, slag, ores, foundry sand, etc. . . . sort ferrous from non-ferrous parts . . . and segregate ferrous from non-ferrous materials, minerals, etc. Trouble-free with no D.C. power supply required—no production stoppages as result of power failure. Homer's "Radial Pole Design" assures highest magnetic strength across entire working face of pulley for deep, effective penetration and positive control of magnetic materials. Write for Bulletin PY-260.

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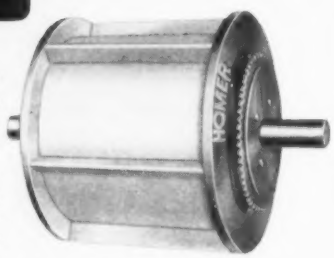

Homer Magnetic Drums automatically and economically beneficiate ores . . . remove tramp iron from slag, coke, foundry sand, ores, etc. . . . and separate ferrous parts from abrasive material following tumbling barrel operations. For installation at discharge end of gravity, screw or belt conveying systems and for use with tumbling barrels. Permanent, non-electric and trouble-free—Homer Magnetic Drums require no outside power source. Homer's "Radial Pole Design," with permanence of magnetic strength guaranteed, assures maximum effectiveness at all times. Complete details in Bulletin MD-200. Write for it today.

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John E. McDonnell, appointed New York district manager, Edison Storage Battery Div., **Thomas A. Edison Industries.**

John H. Hall, elected comptroller, **The Youngstown Sheet & Tube Co.,** Youngstown, O.; **K. Calvin Sommer,** named treasurer; **Paul M. Haas,** appointed asst. comptroller; **Howard R. Fitzsimmons,** appointed asst. comptroller; **Theodore A. Johnson,** appointed credit manager; **E. Ross Mateer,** appointed general auditor; **Ronald H. Dalleske,** named works auditor; **Lawrence H. McCully,** appointed manager, Commercial Research Dept.

Norbert E. Willkomm, appointed manager, Hamilton Steel Warehouse, **Jones & Laughlin Steel Warehouse Div.,** Cleveland.

Walter E. Willard, appointed manager, Structural Steel Fabricating Div., **The R. C. Mahon Co.**

Quentin N. Groth, appointed asst. to general manager, Axle Div., **Eaton Manufacturing Co.,** Cleveland; **Paul T. Shirar,** named chief industrial engineer.

Ben D. Thomas, named asst. district manager, Detroit area, **Superior Steel Corp.**

Clyde L. Gunliffe, named district sales manager, Cincinnati office, **Wheeling Steel Corp.; Paul T. Wilson,** appointed district sales manager, St. Louis office; **Elmer C. Yanda,** appointed district sales manager, Houston office.

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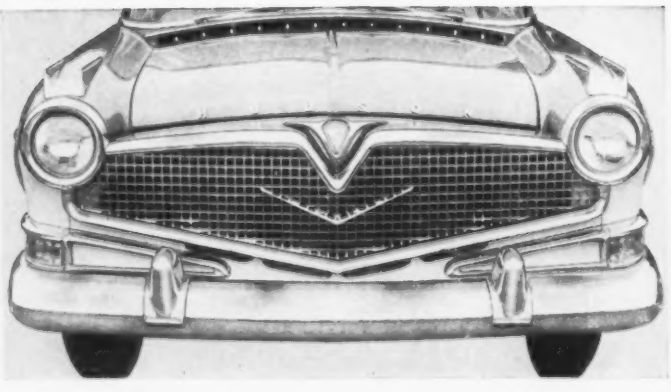

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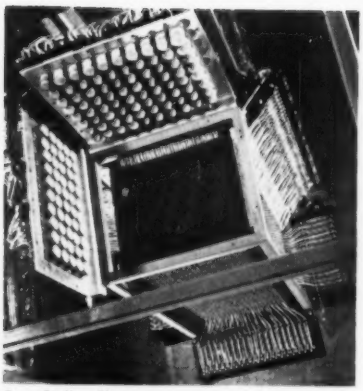


Ezra Stoller Photo

FEATURE ARTICLES

Servants to men's minds—

Where Computers Fit In Metalworking

By J. J. OBRZUT, Technical Editor

◆ Computers are cutting out an impressive record for themselves in metalworking . . . Yet, they've only scratched the surface of their real potential . . . With the speed of light, and with accuracy surpassing that of humans, they come up with answers to problems previously impossible to work out.

◆ Their uses are so wide and varied as to be limitless . . . Whether it be in engineering, science, material control or any other branch of metalworking, they cut down jobs from months to minutes . . . With installations running into the thousands, getting enough personnel will be the big problem.

◆ THINGS have happened fast since computers came into business and industry. With them came new words, new ideas, new speeds and a lot of confusion. Terms like "big brains" and "wizards" were used to describe these electronic machines. But in reality, they're slaves to human minds, capable of doing what you tell them to do with lightning speed.

How does industry use computers?

Mathematically, there are an infinite number of answers. But let's start with a half-dozen or more—all from company executives.

A company president: "The machine forecast our tax and profits picture for years ahead . . . in minutes."

Chief comptroller: "In one minute it does the work a man with a hand calculator can do in 50 hours — working at top speed."

Design engineer: "The machine ran through 9180 design combinations to find the best. This would take about 10 years to do any other way."

An engineering consultant: "We

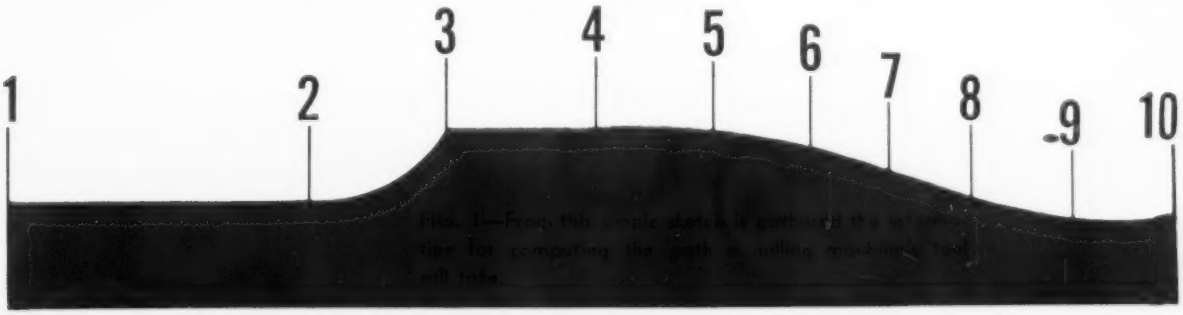


Photo by American Machine & Foundry Co.

THIS Datatron computer can multiply 200 pairs of 10-digit numbers in a single second. In 15 minutes, it'll calculate problems that took a programmer two weeks to put into computer language.

used the computer to study equipment mortality for a large public utility. The program—involving complex mathematical analysis—was prepared in six minutes."

Production manager: "Our computer provides us with completely automatic scheduling. It tells us our parts requirement input for each assembly for this month, next month, three months hence. And the same goes for our vendor scheduling."

Chief engineer: "We checked the characteristics and behavior of gases in a jet stream under 1900 sets of conditions. It took 10 minutes."

A railway president: "Reports and studies that we were unable to make before will now be available to us."

Steel plant executive: "It has effected new techniques in mechanization and is opening accounting and technical fields which had been impossible with older equipment."

All these statements apply to the use of one or more of the available types of computing systems. They're not endorsements nor commercials. They typify the comments from the ever-increasing ranks of electronic computer users. They give you some idea of the vast scope covered by computer systems. More important, they set you to wondering about your own business problems — in engineering, sales, accounting, manufacturing.

How can a new electronic computer help you? Most answers are likely to be relative rather than absolute. But perhaps the best approach is to find out what these wonderful machines and systems can and cannot do.

It doesn't think

The electronic computer doesn't think. It implements your thinking. Feed it one correct fact or formula and it will supply you with answers that cover 100,000 possibilities. Tell it, for example, that the area of a circle is dependent on the πr^2 relationship and it can respond with the correct areas of millions of circles with varying radii.

On the other hand, feed the elaborate system with a starting premise that is basically wrong and you'll get an infinite number of wrong answers.

The reason for this is quite logical. For any machine or system to be consistently right, it must in itself be consistent. So, depending on the information fed to it, it can just as readily be consistently wrong. The machine does not overstep certain logically prescribed paths even when it is proceeding in a wrong direction.

Modern computers represent a slow progression that began with the abacus. The general field of development was important enough to get the attention of great mathematicians as Pascal and Leibnitz.

Has snowballed since '20's

In the late 20's, Vannevar Bush introduced a special purpose computer capable of measuring physical differences by the turning of shafts. It was built to solve problems in differential calculus. Since then, computer development has forged ahead at a breakneck pace.

Logically, development followed along two separate lines — the digital and analog. The digital computer is designed to count. The analog is designed to measure. A third development is a processing system to convert analog to digital.

These systems are quite complex in operating principles and electronic circuitry. Too complex, in fact, for simple description. As such, the choice of a particular system for a particular use is best left to the experts. All leading equipment makers can provide this kind of service.

The application of computers to specific problems is both easier to follow and of more immediate interest to metalworking. Use of General Electric's numerical contouring system to general purpose milling machines is a case in point.

The system requires a numerical director or interpolator. Its object is to provide a complete manufacturing process for intricately machined parts. It's continuous-path machining automatically controlled from numerical data.

How does it work? Let's start with the simple sketch in Fig. 1. This sketch represents a problem involving a single milling cut. The idea is to automatically machine the contour by milling along the top surface from point 1 to point 10.

Photo by International Business Machines Corp.

UNITS of a computer system click and light their way through intricate problems in minutes. Detailed responses are received on printer in foreground.

Who's Offering Computer Services?

Here are some of the organizations providing computer service of one kind or another. Independent date processing centers accept work on a per job basis.

Armour Research Foundation of Illinois Institute of Technology, Chicago

Battelle Memorial Institute, Columbus, Ohio

Burroughs Corp. Research Center, Paoli, Pa.

Cornell University, Ithaca, N. Y.

Datamatic Corp., Waltham, Mass.

International Business Machines Corp., New York

Massachusetts Institute of Technology, Cambridge, Mass.

Pi-Square Engineering Co., Inc., Boston

J. B. Rea Co., Santa Monica, Cal.

Remington Rand, New York

Wayne University, Detroit

Westinghouse Electric Corp., East Pittsburgh, Pa.

This surface is made up of a number of different segments. Note that the surface extending from point 1 to point 2 is a straight line. It is followed by a radius starting at point 2 and ending at point 3. The data points, starting with point 4 and ending at 10, represent an empirical curve.

The "raw data" — which ultimately helps control the machining of this contour — consists of the coordinates of these 10 points plus other information to completely define the surface to be machined. Once the raw data has been collected, the "programming" function is ready to begin.

This function is done manually by a programmer, a person with a lot of machining experience and some knowledge of high school mathematics. He determines how to place the work on the miller, the tool to be used, how to make the cut or cuts, and tabulate the raw data in a programming form.

The programming form will have a line for each section of the cut. It will spell out every detail of machining in its simplest numerical form. This information will normally be transcribed in punched tape or cards.

After programming, the computing function will take the accumulated data and compute the path of the tool's center. An interpolator then takes the output data from the computer and provides continuous data along the tool center path. This information is then fed to a machine control that actually causes the machine to move as directed.

What about the use of electronic computers for problem solving in engineering, design, production control, cost accounting?

Essentially, all these problems are approached in a similar manner. First, the raw data must be accumulated. This information, in turn, must be "programmed" — or prepared for the computer.

Involves three steps

There are three distinct steps to programming. Essential information (raw data) must first be analyzed. Then the desired results must be decided upon. Lastly, all methods and procedures must be translated into language a computer can understand. This usually means reducing the details of a problem to their simplest numerical form.

Programming itself is laborious

Photo by Remington Rand

OPERATOR gets set to receive answers from this high-speed printer. It can print 600 lines a minute.

Computers aren't for the big fellows alone. Smaller plants can rent computer services, borrow, even team up in buying one. And lower-cost, smaller units are on their way.

and far from simple. To program a major commercial problem may take from 3 to 10 weeks or more.

The answer to this hurdle is found in still another computer technique known as "automatic programming." This setup takes the drudgery out of programming and speeds the entire process while improving its accuracy.

One such automatic programmer has been developed by Remington Rand. It stipulates that the computer user need only know what information is available and what results he requires. It is not necessary to have complete understanding of the computer code — the numerical language used by the computer. The automatic programmer is a kind of dictionary, ready to provide the right language automatically.

How programmers work

Automatic programming consists of two basic types — interpretive routines and compiling routines. An interpretive routine translates a master program into computer code and also does other operations. But it provides the programmer with nothing but processed results. It's especially useful in mathematical and scientific work but is less efficient than a compiler in preparing commercial programs.

A compiling routine (or compiler) translates the master program into computer code. It also records the finished program for further use. Such recordings are made on magnetic tape. Other functions of the compiler include allocating memory space and assembling subroutines into a finished program.

Of considerable importance to the programmer is the fact that the compiler produces a program that can be used over and over again. The system is flexible in that you can alter the program to suit changing business needs.

Who's using computers in the metalworking industry? For what purposes? Answers to these questions are as broad as they are varied and complex.

The engineering and scientific fields are natural uses for computers because related problems can often be stated in mathematical terms. Researchers benefit by the fast answers they can get on laboratory studies in progress, directing them through each step. All kinds of design problems are also given to computers.

Westinghouse Electric Corp. works out complicated calculations on its computer setup in designing power transformers. The computer, one of IBM's late models, prints the details of the complete electrical design and much of the mechanical design. In less than five minutes, the shop has the information it needs to start making the core and coils. It tells how much iron, copper and insulation is needed, and the amount of cooling required.

This computer also has other uses. It determines the rate at which parts and materials are used, provides manufacturing information to the shop, keeps production reports up-to-date, summarizes costs, plus other jobs.

At Schenectady, General Electric uses a computer in developing large steam turbine-generator units. It obtains advanced calculations on heat balances, combined critical speeds, rotor heat transfer, plus other correlated problems.

One problem which would normally take three years of errorless work is now solved in about 15 minutes. And in one minute, this computer does as much calculating as a person can do in 50 hours with a hand calculator.

Pretests jet designs

Jet plane design is still another field where computers pay off handsomely. Even while the plane is only an idea, the computer can put it through a complete simulated flight test. The amount of time, labor and materials saved can run into millions of dollars in development costs. At most, the computer supplies all the information in a matter of hours.

At Alco Products, Inc., Dunkirk, N.Y., a computer helps thermal engineers in designing heat-exchanger equipment. At Lockheed's Burbank plant, two computers schedule and control manufacturing operations, pinpointing to the day the line position of assemblies still many months from being started.

Speed piping calculations

Harassed GE engineers turned computers loose on still another problem, in designing steam piping systems for large central power stations. These cut through the maze of simultaneous equations involved in properly designing such systems. Speed is such that several calculations of one system are now possible. Result of the more complete and reliable flexibility analyses: better systems, lower cost possibilities.

Present uses of computers have barely scratched the surface of their potential. About five years ago, the computers in use were far and few between. Today, there are literally thousands of installations, and the number keeps growing at a fantastic rate. So much so, that the big problem now is in training and staffing new setups. One estimate places the number of analysts, programmers, coders and operators needed within the next 10 years at 150,000 to 200,000.

How can medium-size and small plants afford the use of a computer? Actually, there are several ways: (1) Rent time on a manufacturer's service computer on a per job basis, (2) Rent time through an independent data processing center, (3) Join with other firms in purchasing a computer, or (4) Seek out those users who can spare computer time.

There's also talk of a small desk computer for small firms. This is said to be "just around the corner." Once it makes the turn, the market should be a real bonanza.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept. THE IRON AGE, *Chestnut & 56th Sts., Philadelphia 39, Pa.*

How Heat And Time Affect Welding

◆ In each welding pass, temperatures at the weld zone can jump to 2500°F and higher . . . This temperature changes steel parts down at the crystalline level . . . Tensile strength and other mechanical properties may not be the same as before.

◆ To predict these changes and compensate for them, you need to know what happens to the workpiece as you weld . . . Simply and clearly, this article answers the question . . . Tips on using metallurgical data to get stronger and more serviceable joints are included.

By A. C. WARD, Electrode Specialist
Welding Dept.,
General Electric Co., York, Penna.

◆ IN FUSION WELDING, you always heat treat the workpiece at least locally. The microstructure of the weld zone changes, sometimes for the worse. Understanding this makes it easier to appreciate the importance of heat control in weld fabrication.

Temperatures rise to 2500°F and higher in welding many metals. For most, including the ferrous alloys, this is far above the transformation point—that critical temperature forcing changes in the crystalline microstructure of the workpiece.

This means that metal adjacent to the weld zone changes its crystalline structure at least twice; as it heats and again, as it cools.

These crystalline changes have no connection with stress relieving operations. In stress relief, lower temperatures are involved. Mild steel is relieved at about 1150°F, for example.

After welding, the workpiece is changed in many ways. The weld zone has different mechanical properties than before. Tensile strength can be higher or lower. Compressive strength, shear modulus and impact properties are often not the same.

Anticipate changes

Although welding always alters the properties of the workpiece somewhat, its effect can be predicted and compensated for. To do this, you have to know what happens down in the microstructure of the heat-affected zone during welding.

Look first at the variables. How these changes take place, when and where they occur, and their mag-

A. O. Smith Corp.

FIG. 1—Note the grain structure in this square butt fusion weld of titanium alloy sheet. It clearly showe, in exaggerated form, the transition zone (left and right) the refined grains, and in the center the coarse grains. Weld heat did this, and changed the properties of the base material at the same time.

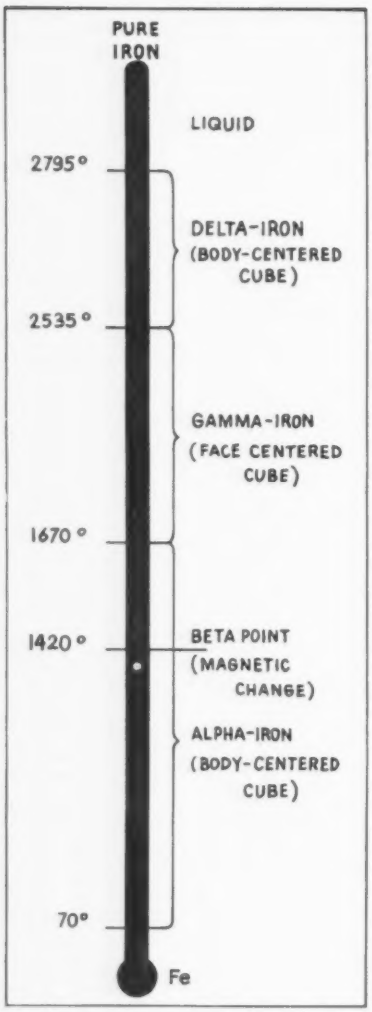


FIG. 2—Both pure iron and carbon steel undergo similar changes in crystal structure as they heat, cool.

nitude depend on (1) the carbon and alloy content of the workpiece material, (2) part thickness, (3) heat input in welding, (4) speed of travel, (5) number of passes, and (6) the rate at which the workpiece cools.

To see how these variables control mechanical properties of weld-fabricated parts, recall first what happens on heating and cooling pure iron.

At room temperature, pure iron forms stable crystals called alpha iron. Each alpha iron crystal contains nine atoms of iron.

Now heat the crystals. At 1670°F —a cherry-red heat—the iron atoms reshuffle their arrangement. Another crystalline structure forms, called gamma iron. Each gamma iron crystal contains 14 atoms of iron. Lower the temperature below 1670°F, and the nine-atom crystals of alpha iron reform.

Continue heating above 1670°F. The gamma iron crystals change again at 2535°F, this time into delta iron crystals. All this occurs while the metal is still solid (see Fig. 2). Pure iron melts at 2795°F.

Use ITD diagrams

The basic pattern of crystalline change described for pure iron holds fairly true for steels as well. You can expect this, for steels are essentially iron alloyed with carbon. Fig. 3 shows the relationship of one crystalline form with another in steels of varying carbon content at varying temperatures.

The Iso-thermal Transformation Diagram is more helpful. This diagram (also called an ITD) plots time against temperature. By controlling the cooling rate, you can predict the moment when one crystalline structure changes into another. You do this by graphing the cooling rate on the ITD and observing at what time it crosses the lines indicating a change in the microstructure of the metal.

Such diagrams exist for all major types of carbon and low alloy steel.

Fig. 4 shows simplified curves that give a general idea of how the Iso-thermal Transformation Diagram can help pin down correct welding procedures and post-weld heat treatment. Ignore for the moment the five cooling curves.

In examining both Figs. 3 and 4, remember that the terms merely define how the carbon is alloyed with pure iron: (1) Austenite: crystals comprising a solid solution of carbon in gamma iron; (2) Ferrite: crystals comprising a solid solution of carbon in alpha iron; (3) Pearlite: crystals comprising a mixture of ferrite and

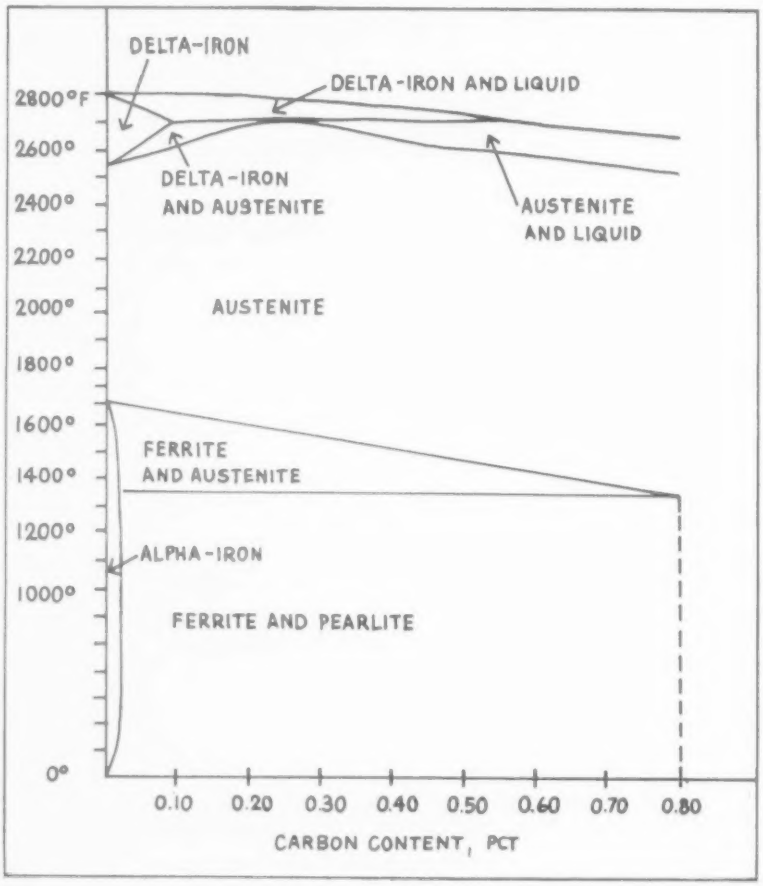


FIG. 3—Iron, Iron-carbide Equilibrium Diagram shows effect of carbon on crystalline changes with varying temperature.

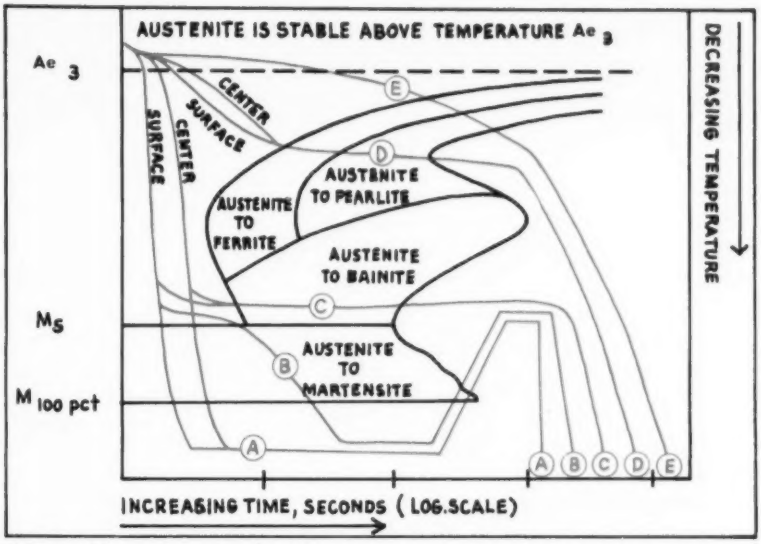


FIG. 4—Here's how standard heat treatments affect steel. (a) Quench and temper to produce tempered martensite, (b) Martemper to produce tempered martensite, (c) Austemper to produce bainite, (d) Iso-thermal annealing to produce ferrite and pearlite, (e) Conventional anneal to produce ferrite and pearlite. Heat treat processes can end at the same time, but are staggered to distinguish them.

iron carbides; (4) Bainite: crystals similar to but harder than pearlite, and with different appearance under the microscope; (5) Martensite: crystals comprising carbon trapped in gamma iron.

Control cooling rate

Think of martensite as a brittle structure liable to crack under even internal stresses. Then the significance of heat control in welding becomes obvious. Ferrite and pearlite correspond to the microstructure found in annealed parts.

Each ferrous alloy has an upper critical temperature (Ae_3). Below this temperature, austenite cannot exist, and must transform into ferrite and carbides, or into martensite. Which structure the austenite changes into depends on the speed at which the part cools from welding temperature.

Quench the workpiece fast, and the metal cools so rapidly that it transforms directly from austenite to martensite. You end with a supersaturated, unstable solid solution of martensite.

Bring down the temperature more slowly, as in annealing, and the austenite transforms into ferrite, pearlite and carbides.

Since each welding pass is essentially a heat treatment, it helps to know how the conventional heat treat processes fit in. The cooling curves of Fig. 4 diagram this.

In conventional quenching and tempering (curve *a* in Fig. 4), you heat to the austenitic range (Ae_3), and cool fast enough so no ferrite forms. Transformation occurs in the martensitic band, Ms to $M_{100\ pct}$, and yields maximum matensite. Note that the surface and the center of the part can cool at different rates.

Following formation of the brittle martensite, the part is tempered. The higher the tempering heat, and the longer you hold the part at temperature, the softer and more ductile the steel becomes.

In tempering, the supersaturated solid solution of martensite throws off carbides as a precipitate. The martensitic structure thus stabilizes. Relief of internal stresses and improved ductility result. The carbides diffuse through the martensitic structure to soften it somewhat. The right-hand section of curve *a* diagrams this.

Martempering (curve *b* in Fig. 4) is handled in much the same way. But the cooling rate is reduced as the metal approaches the temperature at which martensite begins to form (Ms). When center and surface temperatures of the part are the same, the heat treat operator continues cooling down through the martensitic band. This forms martensite at both surface and center at the same rate. Temper as with the conventional quench-temper cycle.

Austempering is a hardening process, shown as curve *c* of Fig. 4. It's based on the transformation of austenite to bainite. The end result is bainite, similar to pearlite, save that it shows a different microscopic appearance and is harder. The ITD permits predicting the time-at-temperature needed to bring about the transformation.

Conventional annealing calls for heating the steel above the upper critical temperature (Ae_3). Then it is slowly cooled to make sure complete transformation from austenite to ferrite and pearlite takes place.

In iso-thermal annealing, the idea is economy. The lowest heat treat costs result in taking the steel through the thinnest part of the ITD at the most economical temperature. The end product is the same as that obtained in conventional annealing.

Hold costs down

How can the welder use this information? First, by knowing how the metal being welded responds to heat treatment.

Consider the ITD for a typical mild steel weld metal, a rimmed steel containing 0.06 pct carbon and 0.43 pct manganese. The ITD shows the material will not form much martensite, even if drastically quenched. This means weld metal cracking due to internal stress of a martensitic structure will not occur. The weld metal is less likely to crack than some others.

In addition, the ITD tells what to expect of metal adjacent to the weld zone. It warns the welder of the formation of brittle martensite. It calls attention to the need for post-weld heat treatment to avoid failure in service through stress cracking. If you know how long the workpiece takes to cool down to room temperature, then it's relatively easy to determine whether martensite is present. Just read it off the ITD describing the steel being welded.

Lower operating costs—

Magnesium Swings More Weight In Trucking

By G. K. GLAZA, Development Engineer,
Magnesium Technical Service and Development Dept., The Dow Chemical Co., Midland, Mich.

◆ Truck builders like magnesium more and more as a structural material . . . Some 25 firms are now building truck bodies containing magnesium . . . Higher payload, lower operating costs encourage this.

◆ Load-bearing walls of magnesium eliminate the structural framework found in conventional design of transport equipment . . . More cubic content results with less weight . . . Assembly costs less.

MAGNESIUM SHEET 1/8 in. thick provides adequate rigidity to support truck body roof and confine cargo. Load-bearing wall resists denting.

◆ MAGNESIUM interests truck builders because of its light weight and favorable modulus of elasticity. These traits lead directly to simpler design, bigger payloads, and lower operating costs.

Not much magnesium went into truck bodies until recently. Heavy military demands during the Korean war sharply curtailed civilian uses.

Today, the situation is different. Between 20 and 30 firms are building van, platform, and flat-cowl truck bodies containing large amounts of magnesium.

Monocoque design helps

Use of the monocoque design principle makes this possible. Adopted from aircraft industry usage, the term monocoque translates as "single-shell." It most nearly describes a structural skin rigid enough to support itself without bracing. In airplanes, monocoque usually refers to a type of wing construction in which the metal shell, although attached to horizontal spars, bears most of the stresses itself.

In monocoque truck-body construction, metal walls 0.125 to 0.188 in. thick provide structural rigidity without vertical body posts of any type. Conventional truck bodies are

built by covering a structural framework with thin-gage metal sheets, 0.032-0.51 in. thick.

Magnesium lends itself better to monocoque construction than any other metal because of its light weight and rigidity.

The material weighs two-thirds as much as aluminum per unit volume, and is less than a quarter steel's weight. Per unit of weight, this means the magnesium sheet or structural section is far thicker.

Figure rigidity this way

The rigidity of any panel is directly proportional to the cube of its thickness, multiplied by the metal's modulus of elasticity, ET^3. Barring great dissimilarity of the E factor, rigidity depends on the thickness of the material.

Consider a magnesium sheet weighing 100 lb. It will be half again as thick as aluminum sheet of equal weight and surface area. Compared with sheet steel of like weight and dimensions, it will be over four times thicker.

This magnesium sheet (E= 6,500,000) will be about 2¼ times more rigid than aluminum (E= 10,300,000 psi.) and 17 times more rigid than steel (E= 29,500,000).

In truck-body design, magnesium need not substitute for either aluminum or steel on an equal weight basis. A magnesium body 20 pct lighter than aluminum is amply rigid for monocoque design. The same magnesium body can be 50-60 pct lighter than steel construction.

The truck builder also stands to gain by the simple speedy assembly possible with monocoque construction. With side and front framework eliminated, assembly takes less time and less effort. Only one-third as many parts are necessary, so far fewer fasteners are required.

Thick-gage monocoque construction takes only half the number of rivets needed for watertight sealing of thinner-gage conventional construction.

Magnesium sheet and extrusions aren't tiring to assemble. One man can handle an extruded corner post easily. Two can move the thick-gage side panels.

Despite its structural strength and stiffness, magnesium is sawed or drilled at high speed. When installing insulation in refrigerated truck bodies, there's no time lost fitting panels around sideposts, since these members do not exist. Special fitting is required only around doors and around the area of the wheel housings.

Painting the magnesium shell was once something of a problem. It has been simplified by development of new cleaning treatments and primer coats. Sheet and extrusions now come from the mill with a baked primer coat already applied. All that's needed is a topcoat, such as standard automobile enamel.

Metropolitan Body Co., Bridgeport, Conn., recently became the first builder to mass-produce truck bodies largely of magnesium. This division of International Harvester Co. uses 400 lb of magnesium sheet and extrusions together with aluminum in one lightweight multi-stop delivery truck.

Where it's used

Magnesium sheet ⅛-in. thick is used for thick side panels and the floor center panel in the monocoque-design body. Thin-gaged door and roof panels are aluminum. All extrusions are magnesium including side and rear door posts, side roof rails and rub rails. Rear door header and floor cross sills are also of extruded magnesium construction.

The truck weighs 1280 lb. This is 780 lb less than the comparable steel model, and 180-220 lb under an aluminum body of the same type.

The delivery truck sells for about the same price as an all-aluminum body of approximately the same dimensions.

Outside width of 80¼ in. at the rub rails is about the same as the steel truck body. But the magnesium model is 8 in. wider inside. With the lightweight body, capacity ranges from 352 to 466 cu ft, an 11½ to 14 pct gain over the steel body.

Resists impact

The company is geared to turn out ten of these light weight bodies each working day.

Truck bodies of any type built of magnesium in a monocoque design promise several advantages. Bigger payloads are possible through (1) reduced structural weight, (2) enlarged interior dimensions, and (3) less dead space.

Or the user can haul identical payloads and cut costs substantially because, (1) Original chassis equipment costs less. Smaller engines give the same speed as a heavier engine in a heavier truck. Smaller tires and springs will do the job. (2) Less fuel is required. (3) Tires last longer.

Monocoque construction protects the cargo well. The thick-skinned side panels are quite resistant to dents and punctures.

Significant savings are reported also on taxes and insurance. Most states base tax and insurance rates on unladen weight. (New York is one major exception.) Tax savings with the lighter-weight trucks can run to $35 per 1000 lb.

MULTI-STOP delivery truck, largely of magnesium, weighs 1280 lb. A smaller engine can carry the same payload as formerly.

Lightweight, acidproof—

How Plastics Curb Corrosion In Metal Processing

By J. H. LUX, President, Haveg Industries, Inc., Wilmington, Del.

◆ Corrosion-resistant plastics continue to find new uses in metal processing . . . They've already proved themselves in highly corrosive situations, and are often self-justifying in more moderate service.

◆ Cleaning, pickling, etching and plating baths can cost less to operate with plastic lining and acid-resistant ductwork . . . In certain metal refining setups, fume scrubbers, piping and even a 200-ft tall exhaust stack —all of plastic—have fought off corrosion exceptionally well.

◆ PLASTICS can be your best bet for controlling corrosion of in-plant metal processing equipment.

Under severely corrosive conditions, the right plastic may be the only material that will stand up. Even in more moderate service, a plastic may be the proper choice from a cost viewpoint.

But which of the hundreds of corrosion-resistant plastics available should you choose? And where do they fit in metalworking?

Generally speaking, plastics find use where metals are smelted, refined, recovered, cleaned or finished.

Corrosive conditions occur in refining and recovering such metals as copper, gold, manganese, magnesium, molybdenum, silver and zinc. In metal cleaning, pickling and etching, the baths employed are often highly corrosive. When plating metals, electrochemical action can greatly accelerate the normal rate of corrosive attack by the plating chemicals.

In all these cases, the fumes resulting can not only erode processing equipment, but also present grave health hazards to workers.

Where used for their corrosion resistance, plastics justify themselves largely on one basis: They cope with harsh environments better or less expensively than metal. Realize that no single plastic yet developed will solve all corrosion problems associated with the processing of metals. But synthetic resins, fortified at times with chemically inert fillers, have come a long way in just a few years.

A number of different plastic resins have been developed for heavy-duty corrosion-resistant service. These include the (1) phenol-formaldehydes, (2) modified phenolics, (3) furfuryl alcohols, (4) polyvinylchlorides, (5) polyesters, and (6) such fluorocarbons as tetrafluorethylene (Teflon).

Often they're fortified

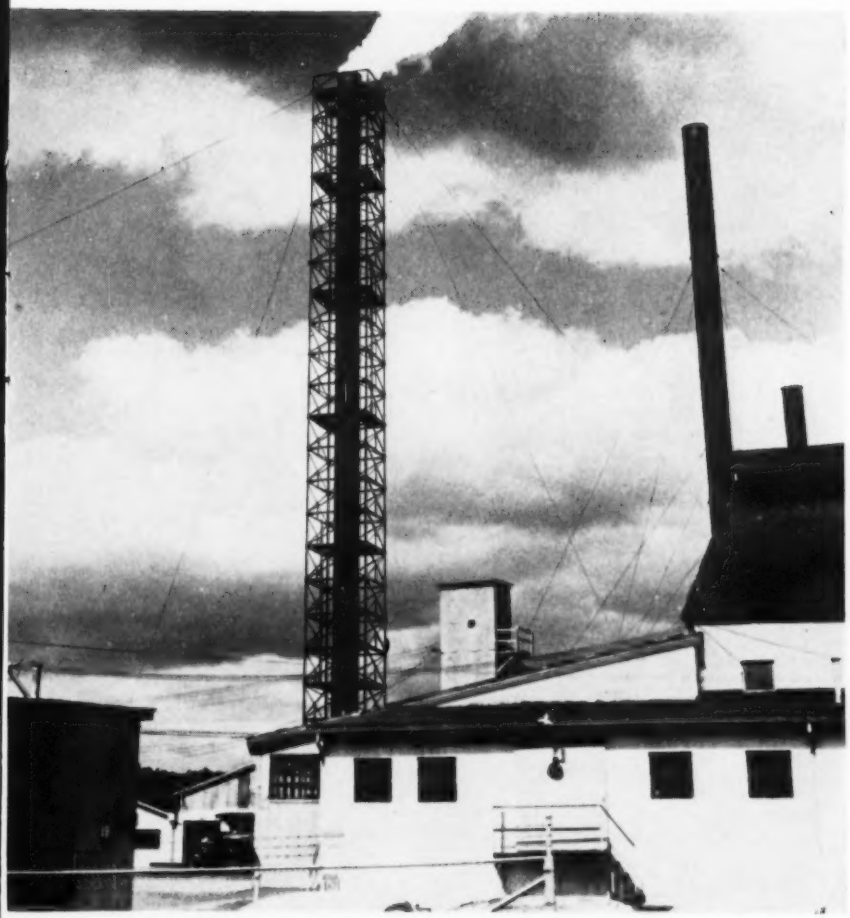
Frequently the basic resins are fortified with chemically inert materials, such as graphite, glass fiber or acid-digested asbestos fiber. Heavy duty plastics result, each capable of withstanding one or more particular kinds of highly corrosive service.

Cleaning, pickling, etching and electroplating installations present three problems: (1) control of corrosive solutions, (2) control of corrosive fumes, and (3) protecting workers against both.

Polyvinylchloride-lined processing tanks are already widely used. In many installations, they have served years without deterioration.

Where To Use Corrosion-Resistant Plastics

For in-plant corrosion protection
Agitators
Crystallizers
Decanters
Distillation columns
Electrolytic cells
Evaporators
Exhaust stacks
Fans
Fume ducts
Funnels
Heat exchangers
Hoods
Pickling tanks
Piping
Pressure tanks
Pumps
Reaction vessels



PLASTIC STACK, 200-ft tall, withstands attack by sulphurous acid, sulphur dioxide. Of phenol-formaldehyde, it weighs 42,000 lb.

Plastic ductwork, exhaust chambers, fume scrubbers and stacks are less well known. Yet they have little trouble justifying themselves in many metalworking plants.

Thompson Products, Inc., Cleveland, treats a wide variety of parts on both a production line and a batch basis. Some parts are cadmium plated, some chrome plated; others are pickled and etched. Each operation requires different processing.

For example, the pickle line at the firm's Coit Road plant uses two highly active baths: a 35 pct nitric acid solution, and a blend containing 30 pct nitric acid and 2 pct hydrofluoric acid.

Previously, Thompson used black iron ductwork with various types of protective coatings both inside and out. The ducts required replacement every three to four years, due to corrosion.

The firm installed a ventilation system of glass fiber-filled polyester plastic. Fume ducts, all ductwork, exhaust chamber and stack are plastic.

The setup shows no sign of deterioration after 10 months' service. It costs somewhat more than its steel equivalent. But less maintenance of the plastic is needed, and flanges do not leak as did the metal ducting.

From a safety viewpoint, the plastic system is a marked improvement. Pipes 3 in. diam and drilled with 0.25-in. holes are located at the tank fronts. Air from these holes blasts across the tank surface and into the fume hood. A fume scrubber extracts gaseous acids from the exhaust air with a series of water sprays.

Some metal refiners rely heavily on corrosion resistant plastic equipment. It's used extensively, even at high temperatures, in the electrolytic refining of copper, silver, zinc, gold, magnesium and manganese.

Tanks, piping, ducts

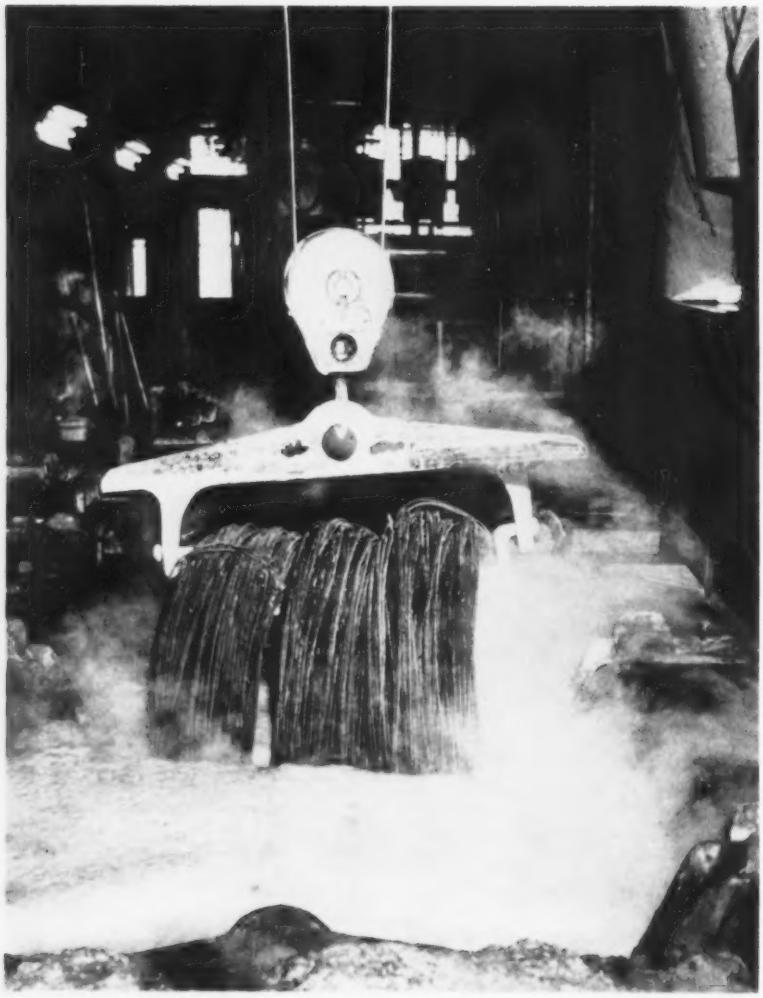
Plastic tanks as large as 12 x 4 x 4 ft deep serve in electrolytic copper refining. Typically, thin sheet cathodes of pure copper hang between smelted, impure copper anodes in a copper sulphate solution containing free sulphuric acid. Pure copper is electrolytically removed from the impure anodes and deposited on the copper cathodes as the solution circulates continuously through the tank.

The copper sulphate solution feeds to and from the electrolytic cells in plastic piping. The pipe protects two ways: (1) It completely resists the corrosive action of the copper sulphate solution, and (2) It electrically insulates the solution, thus preventing costly electrolyte deposition and stray current losses.

Despite a relatively low strength compared with structural steel, exhaust stacks of plastic are practical. Probably the tallest plastic fume stack, 200-ft high, is installed at the Washington, Pa., plant of Molybdenum Corp. of America. Weighing 42,000 lb, the stack is part of a plastic ventilation system that includes a fume scrubber and ductwork as well as plastic piping.

The smelter roasts molybdenum sulphide concentrates to produce molybdenum oxide. To recover molybdenum sulphide and rare earth compounds lost up the stack, the metals plant installed a flue dust recovery system. Electro-

Rolls
Sand filters
Separating tanks
Storage tanks
Surge tanks
Vacuum filters
Valves



HOT SULPHURIC ACID pickle does no damage to plastic ducting. Fume ventilation also protects exposed metal parts near tank.

static and ultrasonic particle clumping as well as centrifugal and gravity collection methods were rejected because of unsatisfactory recovery rates.

Installing a fume scrubber to wet down the flyash introduced a new problem: Sulphur dioxide in the exhaust gas dissolved in the water spray to form sulphurous acid in concentrations up to 5 pct. This caused stack corrosion. Even a stainless steel stack never lasted more than 8 months.

Three years now

A stack molded in sections from phenol-formaldehyde resin with acid-digested asbestos fiber filler has operated now for three years without sign of deterioration.

The complete unit cost $50,000, split into $25,000 for the plastic stack, and $25,000 for the structural steel scaffolding and installation. The stainless clad tower cost $20,000 plus $5,000 for erection.

On the basis of service alone, the plastic tower pays for itself every 16 months or less. By recovering molybdenum sulphide and rare earths from the fly ash slurry, the entire installation pays for itself at least every year.

Plastics even help make better cements. Mortar of Portland cement base is attacked by many chemicals, although the brick or tile it joins may resist corrosion. A whole series of phenolic, furan and polyester cements now exist with superior chemical resistance. In repeated tests, the tile or brick itself fractures before the plastic bond fails.

Plastic equipment shows up well in corrosion service for other reasons than its inertness. Lightness is one such advantage.

Some plastics resist impact well. United States Metals Refining Co., Carteret, N. J., found this so after installing glass fiber reinforced polyester plastic tanks.

In the copper refining operation there, lead-lined concrete tanks traditionally held corrosive copper sulphate solution. Overhead cranes lift and drop copper anode racks weighing 11 tons each. The tank rim supports this full weight. Damaged lead rims formerly kept a whole crew of lead burners busy. With the plastic tanks, such repair has been practically eliminated.

These Points Favor Corrosion-Resistant Plastics

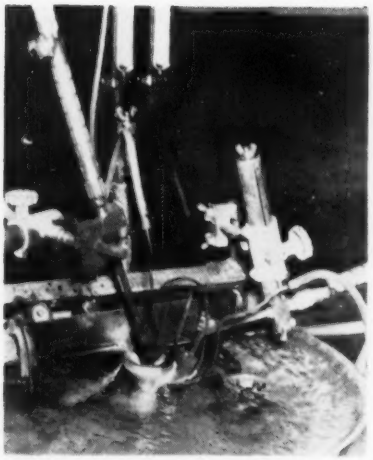
- **Withstand high temperature, impact, thermal shock**
- **Bond easily and can be chemically welded**
- **Machine readily: can be cut, turned, threaded, drilled, tapped, planed, milled, and ground**
- **Cast, mold or repair easily, in shop or field, with simple tooling**

In comparing costs between metallic and plastic metal processing equipment, consider not only the original price but also installation and maintenance.

Recognize that an individual tank in plastic seldom costs less than in mild steel. Large rubber or lead-lined steel tanks, and even tanks of stainless steel, can sometimes cost less than those of plastic. But adding painting, repair, and other maintenance charges alter the picture. On this basis, polyester fiber glass tanks can usually compete with steel tanks up to about 8,000 gal capacity.

Using two torches—

Complex Heat Patterns Flame-Harden Part



TWO OXYACETYLENE burners lay down required heat patterns to heat exterior, interior surfaces of the hyperbolic-shaped roller part. Part spins while one end heats at a time.

◆ FLAME-HARDENING operations depend for their success on several factors. Composition of the steel part, its hardening characteristics, the heat pattern formed by the flame-hardening burner, and the way the flame is used are all important.

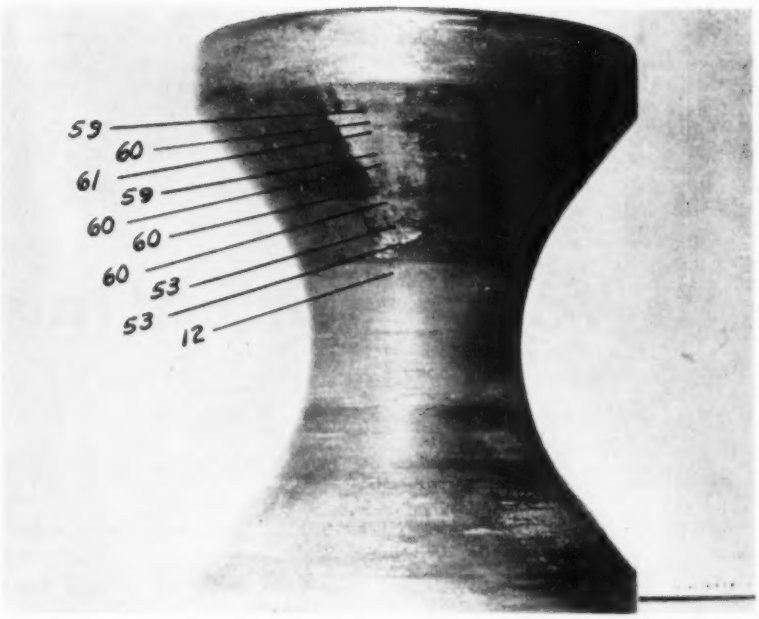
National Cylinder Gas Co., Chicago, recently solved such a problem for one of its customers, in flame - hardening a hyperbolic-shaped roller.

Center band's left soft

The roller's made of AISI-SAE 1045 or 1046 steel. It stands about 4 in. high and 2½ in. in diameter, and is surface hardened to ⅛-in. depth on both upper and lower outside curved surfaces, with a ¾-in. band in the middle left soft. Inside each hollow end of the roller, a straight portion corresponding in position to the outside curved section is also surface-hardened.

The operation calls for leaving the bottom of each end recess soft.

The apparatus developed for the job, shown above, holds the roller half submerged in water. An electric motor beneath the water tank spins the roller at 100 rpm while two oxy-acetylene burners heat it. One handles the outside surface and the second the interior surface.



HARDNESS of the curved, surface-hardened area runs from Rc 53 to 61. Soft, ¾-in. wide center band is shown by its reading of Rc 12.

Burners are designed to throw heat patterns that closely limit the area to be heated and hardened. Heating time is approximately 20 seconds for each end, with each being heated and quenched separately.

Gas consumption is moderate—about 0.09 cu ft of acetylene per sq in. of roller surface-hardened. Acetylene is supplied at a rate of 181 cfh at 12.5 psi, and oxygen at 220 cfh at 26.5 psi, giving an oxygen-acetylene ratio of 1.21.

Hardness obtained on roller surfaces varies from Rc 53 to 61, with the soft middle area remaining at about Rc 10 to 12.

Hardening changes the surface structure of the steel from fine-grained pearlite and ferrite to a martensitic matrix containing needles of bainite. Varying burner position, flame adjustment and speed of rotation affect both microstructure and case hardness.

APPLIED by caulking gun, this sealer on wing structure must stand up under vibration, structural flexing, thermal swelling and shrinking.

SPOT WELDER works right through this sealer. Material draws away from immediate weld area, then fills in tightly for durable seal.

Can Sealers Fill Your Fabricating Needs?

By R. K. HUMKE, Supervisor, Industrial Coatings and Sealers Group, Technical Service Laboratory, Minnesota Mining & Manufacturing Co., Detroit

◆ SEALERS SOLVE many problems in the making of sheet metal products. Relatively inexpensive and easy to apply, they close unwanted openings or gaps. They shut out (or in) dusts, liquids and gases. They provide vibration- and shock-resisting cushions and separators between surfaces. And within limits, users can get them with a wide range of special properties.

Depending on the particular problem, sealers can resist aromatic fuels,, oil, water—even corrosive chemicals. They can stay firm at high temperatures, or resist flexing at —90°F. Some will expand to double their original volume when heated.

The result is that these versatile engineering materials are finding scores of workaday uses in large sheet-metal-consuming industries, to improve products, cut costs, or both.

◆ Maybe it's water, air, dust, chemicals you want shut out; or vibration you want absorbed, or just holes filled in . . . Maybe its in autos, or tanks, or half a hundred other products that you'd like these things done . . . Chances are that sealers can fill the bill in doing the job for you.

◆ These versatile engineering materials are doing these and scores of additional chores for industrial makers of sheet-metal products . . . Here's a rundown on sealers: what they are, where they're used and how . . . Check them against your production needs.

Aircraft is one such major user. Aircraft wing sections, for instance, are often used for storage. Sealers fill the seams and voids and shut off the fuel-containing space. A liquid two-part synthetic rubber-base sealer used in this application not only offers excellent adhesion to aluminum and good fuel resistance, but stands up under vibration, structural flexing and thermal expansion and contraction as well.

Other aircraft uses include closing off pressure cabins, tanks, compartments, bulkheads, firewalls, and electrical connections against everything from air and

water to servicing fluids like hydraulic oils. Some specially developed sealers for firewalls will resist temperatures to 2000°F. Others remain flexible and adhesive under extreme-cold conditions.

Aerodynamic "smoothing" is another application. Here sealers eliminate or fair exterior surface irregularities to boost aerodynamic efficiency, especially around bolt or rivet patterns and along non-flush joints.

Oil resistant elastomeric base chemical curing sealers are usable for this, or else synthetic rubber base air-drying sealers. Both types are applied easily, sanded and feathered to contour.

In the automotive area, sealers have been used for many years. A weld-through sealer, for instance, permits openings and voids to be sealed prior to spot welding. This is particularly useful where faying surfaces must be closed against leakage. Welds are made right through the sealer, providing an effectively sealed, spot-welded joint. Normal welding procedures are used, and weld quality isn't affected.

Liquid or putty forms

Synthetic resin body sealers keep dirt, grease, oil and water from getting into auto interiors. These are applied as liquids that form or set into solids. Other types are put on in putty form and remain flexible throughout their life.

These are for either extruded use or for gun-type applications.

A most important application of auto sealers is around windshields, windows and lights. Reclaimed rubber base sealers do this job of keeping out rain, dust and dirt. They're applied by flow gun between rubber moldings and metal as well as glass and rubber.

Extruded sealers are used primarily to close large body gaps or metal openings. Of two types —expanding and non-expanding— they can be applied by hand at any point along the production line. The expanding type gives a positive seal in areas where pressure cannot be applied. Degree of expansion of either of these two sealer types can be controlled to suit requirements.

Drip rail sealers are used where

APPLICATIONS					PROPERTIES	
SEAL AGAINST	OPEN AREA	MATERIAL TO SEAL	EXAMPLES	CHARACTERISTICS	BASE	SOLVENT
Water, Air, Dust	Small Regular Seams	Glass	Sealing Auto Windshields & Windows Sealing Seams Auto Bodies	Good Elasticity, Flexibility, Aging—Resists Water	Reclaimed Rubber	Petroleum Naphtha 145-215°F
		Glass, Rubber, Metal	Food Storage Units, etc.	Good Elasticity, Flexibility, Aging—Resists Water	Reclaimed Rubber	Petroleum Naphtha 145-215°F
		Glass, Rubber, Metal	Automobile Windshields and Rubber	Good Adhesion to Glass and Rubber	Natural Resins & Oils	Toluol and Petroleum Naphtha Blend
		Glass, Rubber, Metal and Wood	Miscellaneous Sealing Operations Other Than Refrigeration	Good Elasticity, Flexibility, Aging—Resists Water	Reclaimed Rubber	Petroleum Naphtha 120-278°F
		Metal	Sealing Truck and Trailer Bodies	Cloth Reinforced, Non-stretching (Extrusion)	Oil Soluble Elastomers	None
	Small Seams, Holes	Metal	Sealing Under Snap-on Mouldings	Soft, Flexible—Water Resistant	Oil Soluble Elastomers	Petroleum Naphtha 315-385°F
	Small Holes, Dents, etc.	Metal	"Tamper-proof" Sealer and Metal Filler	Very Hard Set—Smooth Finish When Sanded	Oil Resistant Elastomers	Ketone
	Small Regular Seams	Metal	Weld-thru Sealer for Auto Bodies, etc.	Resists Heat, Water—Will Not Burn in High Flash Heat	Natural Resins & Oils	Contains 9% Volatile Oils
	Large Regular Seams	Metal	Good Adhesive to Metal and Enamel	Heat Conductive Sealer	Natural Resins & Oils	None
	Large Seams, Openings	Metal	Sealing Hulls of Amphibious Aircraft	Oil and Fuel Resistant Sealer—Permanently Soft	Oil Resistant Elastomers	None
		Metal	Sealing Truck, Auto, Trailer Bodies	Good Water and Weather Resistance	Natural Resins & Oils	Petroleum Naphtha 306-408°F
		Glass, Metal	Sealing Between Metal Surface (Auto)	Good Adhesion—Glass and Metal	Oil Soluble Elastomers	None
	Large Irregular Seams	Metal	Sealing Large Irregular Voids (Auto)	Swells 125% When Heat Cured (Extrusion)	Oil Soluble Elastomers	None
Water, Petroleum	Large Seams	Metal, Porous Material	Hull Seam Sealers on Boats	Excellent Resistance—Water, Fuel, Oil, etc.	Oil Resistant Elastomers	None
		Metal	"Slosh-coatings" Inside Gas Tanks	Gas & Oil Resistant, Tough, Flexible	Oil Resistant Elastomers	MIBK (Hexone)
		Metal	Used in Aircraft	High Heat Resistance	Oil Resistant Elastomers	None
Water, Petroleum Pressure	Small Seams, Holes	Metal, Porous Material	Sealing Pressurized Cabins in Aircraft	Good Fuel and Pressure Sealant	Oil Resistant Elastomers	None
	Large Seams, Holes	Metal	Sealing Pressurized Cabins in Aircraft	Excellent Resistance to Gasoline and Oils	Oil Resistant Elastomers	Ketone
Water Pressure, Dust, Solvent	Large Seams, Holes	Metal	Seal Seams in Gas and Oil Storage Tanks	Heavy Putty Consistency Good Adhesion When Set	Oil Resistant Elastomers	Ethylene Dichloride

HEAT-CONDUCTING filler in this sealer, applied between heat transfer coils and a freezer outer shell, helps boost cooling efficiency.

roof panel, side panel and drip rail join. Some will flow to cover the entire drip rail area; others form a bead and hold their position. These are heat-cured during prime or final paint oven cycles to form a tough, elastic seal.

They withstand oven heats from 225 to 400°F without bleeding or staining paint.

Railroads use sealers which are rapidly and simply applied to reduce both production and maintenance costs.

Example is the sealing of air slides in closed railroad hopper cars. Perfect, moisture-proof sealing is essential in preventing spoilage of sugar, resins, or other loads that tend to absorb moisture and cake or pack in transit. Here, a moisture resistant sealer—applied by spatula or flow techniques at air-slide seams—is less expensive than a rubber gasket. At the same time, it's permanent and doesn't wear out or deteriorate.

Smeared around access holes in the roof of electric railroad cars, a permanently soft and tacky soluble elastomeric base sealer protects electric power cables.

Sealer beads are applied to form water- and dust-tight seals around the access holes before cover disks are screwed down. The sealer replaces a cork gasket previously used.

A soft, flexible oil-soluble elastomeric-base sealer, applied with a hand-caulking gun, protects seams and rivet openings in the side fluting of railroad passenger cars against penetration by dirt and water. The sealer chosen is the only one known that will stand repeated washings with passenger car detergents.

Sealing of floor frames, side frames, roof joints, and many other areas against moisture vapor is done using a tough, reclaimed-rubber-base sealer.

The refrigeration and air conditioning industry makes wide use of sealers. An interesting example is the way a non-drying, oil-base 100 pct solids sealer is used to boost the efficiency of cooling and heat dissipating coils. The sealer contains a heat-conducting filler. It's applied between coil and evaporator or tubing and outer shell, to increase the effective heat transfer area.

Moisture-proofing shelf bracket holes and tubing holes in the inner liner of upright freezers is another problem. It's been met by using either a permanently soft and pliable synthetic resin or oil-soluble elastomeric base sealer, or a calendered rubber-base sealing ribbon, reinforced with cloth. The synthetic resin base sealer presses easily into irregular shaped gaps because of its putty-like consistency.

These two materials are also used to seal between sections of stapled or spot-welded multiple-piece interliners.

Keeps out moisture

Outer shells of refrigerators and freezers must be made tight against moisture and dust. A permanently flexible, non-shrinking extruded oil-soluble elastomeric base sealer is used for this, and for sealing around doors to keep moisture from getting to the insulation, where it might condense and freeze.

When back panels of refrigerator outer shells are not welded around the entire edge, a reclaimed rubber base flexible sealer may be used. This expands to 125 pct of its original volume when heated. Thus it fills all voids and acts as a heavy rubber gasket without need of prefitting.

Weld-through sealers also find use where sealers must be applied prior to welding in constructing some outer shells.

The heating and air conditioning industries seal ventilating ducts for better efficiency. An oil resistant elastomeric base duct sealer for this purpose resists water, oil, temperature extremes and abrasion. At the same time it is fast drying, forms a tough rubbery seal, and stays flexible from 200°F to —20°F. Such sealers can be applied by brush, caulking gun or flow gun.

The above rundown suggests where and how sealers are used. But how do you choose the right sealer for a specific job?

Well, a good place to start is by analyzing the service requirements the sealer will have to meet. Ask yourself what minimum bond strength is needed, and what the temperature range will be? Will there be exposure to solvents? To other chemicals? How about abrasion? Are color or flammability factors?

Effects of heat, cold

Temperatures are important. While some sealers stay firm at 200° F, they may fail very quickly if stresses are placed on the film while it's that hot. Yet hotter temperatures are possible for short periods if high stress is eliminated.

Similarly with low temperatures. If a sealing material becomes brittle with cold, it can usually maintain an adequate seal at temperatures below its lower service limit if the assembly is not subjected to shocks or to vibration loads. In evaluating temperature, consider only temperature of the sealer itself.

Another factor—at high temperatures, the deteriorating effects of water, oil, solvents, etc., will be accelerated in most cases. Thus a sealer which resists a liquid satisfactorily at normal temperatures may eventually fail if the temperature is raised.

The acompanying chart shows various sealing products and their characteristics. Some sealers have only one recommended method of application. Others may be applied by several of the half dozen or more commoner means used.

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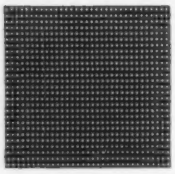

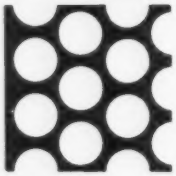

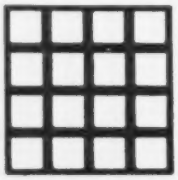

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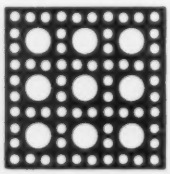

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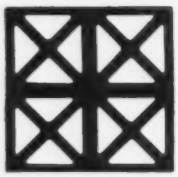

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New Technical Literature:

Catalogs and Bulletins

Plating, processing

Plating and processing equipment is covered in an 8-page folder just published. It illustrates three versatile automatic machines: a low-head side-arm automatic plating machine, a plating and processing machine, and an automatic barrel plating machine. Each is described showing typical floor plans, cross section drawings highlighting important features and actual photographs of units with tanks removed to show their complete structure. *The Meaker Co.*

For free copy circle No. 1 on postcard p. 93

Abrasive products

Reinforced resinoid abrasive products are listed in a catalog presently available. The index is so arranged so that information on the right type of reinforced resinoid wheel may be easily located by picking out the type of operation involved or material to be cut. Three basic types are described: raised hub disc wheels, abrasive cut-off wheels, and resinoid straight wheels. *Bay State Abrasive Products Co.*

For free copy circle No. 2 on postcard p. 93

Cap screws

Stronger assembly of large components for heavy equipment is possible with the increase in head diameters of large socket head cap screws. So states a four-page folder which describes and lists them. It compares new head details with older, smaller head dimensions. Head height in both cases is the same as body diameter. The range of physical properties for the larger size socket head cap screws in both coarse and fine thread series is detailed. A helpful, easy-to-read listing of consumer net prices is also included. *Cleveland Cap Screw Co.*

For free copy circle No. 3 on postcard p. 93

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 93.

Steel tube fittings

Containing 48-pages, a new catalog incorporates engineering data on hydraulic flareless tube fittings. A section is devoted to assembly instructions, materials, finishes and operating pressures. *The Weatherhead Co.*

For free copy circle No. 4 on postcard p. 93

Lathe

A four-page, photo-illustrated bulletin describes a rugged 12-in. variable speed lathe. Actually a wood lathe, it will also handle working of light metals and alloys. Also illustrated are a number of spinning tools and attachments, including a metal spinning tool support, 3-jaw universal chuck, draw bolt, sanding attachment, 4-jaw independent chuck and knock-out bar. *Delta Power Tool Div., Rockwell Mfg. Co.*

For free copy circle No. 5 on postcard p. 93

Thermopiles

Thermopiles for conversion of infra-red energy into electrical energy suitable for amplification and measurement are reviewed in a dozen page brochure. These thermopiles are designed for applications in the fields of infra-red spectrophotometry, astronomical infra-red measurement, emission pyrometry, and as components of temperature control devices. *Jarrell-Ash Co.*

For free copy circle No. 6 on postcard p. 93

Fork truck operation

"How To Operate A Lift Truck," is the title of an amusingly illustrated 24-page, 2-color booklet now available. It is easily read and is packed with information about operating a lift truck, preventive maintenance, safety and basic materials handling. Drawings for setting up an obstacle course are also included. Prepared as part of an operator training program, the publication is slanted for both beginners and experienced operators. It can be studied individually or used as a guide by instructors. *Hyster Co.*

For free copy circle No. 7 on postcard p. 93

Weld tube mill

"Electric Resistance Weld Tube Mills" describes the use of modern tube mills in the manufacture of pipe and tube. The 64-page illustrated handbook gives a step-by step description of the electric-weld process beginning with the roll forming and shaping of tube, through to the finished product. Photographs, drawings and charts illustrate operation, capacities and applications of electric-weld tube mills of various sizes. *The Yoder Co.*

For free copy circle No. 8 on postcard p. 93

Time-delay relays

A company is making available two bulletins to supersede a page of their current catalog. These bulletins contain details on the function of three dial adjustable time delay relays. Catalog part numbers for the standard ranges and voltages in ac, dc and 400 cycle are given. One bulletin describes the surface mounting type and the other bulletin describes the flush mounting type for panel installation. These timers are recommended where frequent change in time setting is necessary. The bulletin sheets include photos of models, diagrams of overall and mounting dimensions, and charts for easy selection of the desired unit according to voltage andtime deay ranges. *For free copy, write request on company letterhead to: A. W. Haydon Co., Waterbury, Conn.*

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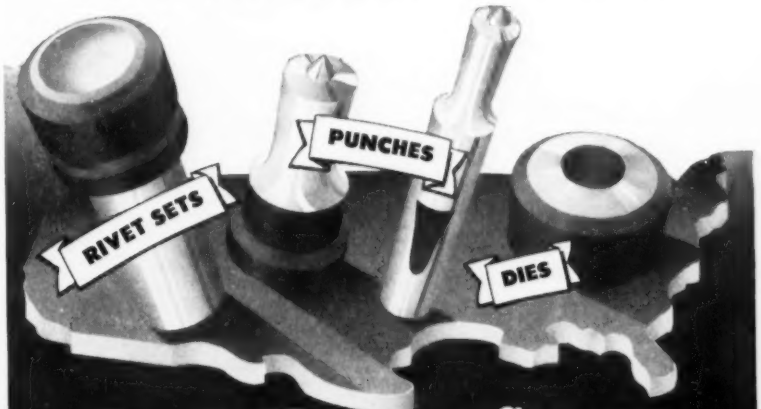

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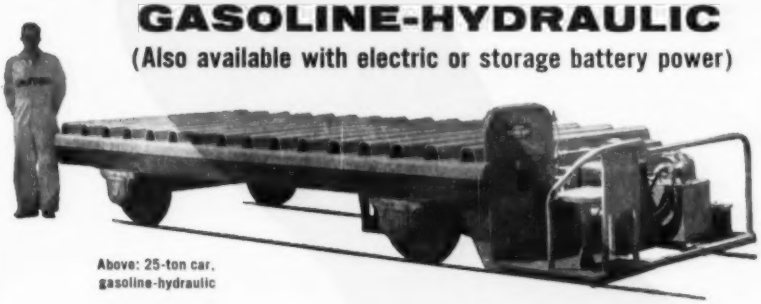
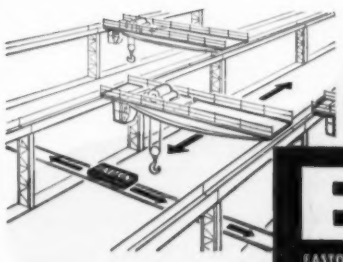


Above: 25-ton car, gasoline-hydraulic



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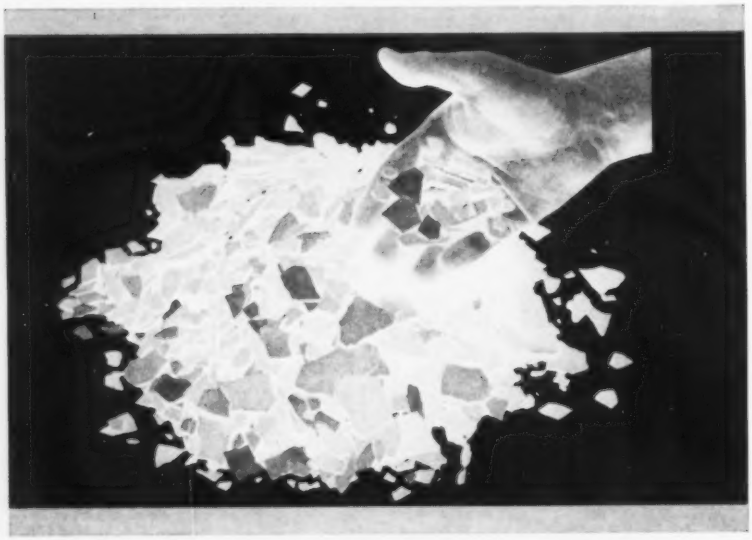

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FREE TECHNICAL LITERATURE

Technical education

The key role of the skilled craftsman as the "anchor man" on industry's technological team is stressed in a new educational aid handbook. The 32-page booklet plays up the importance of apprentice training. It cites the immediate values of vocational-industrial and industrial arts training in helping youngsters get a head start on skill development. "There are no shortcuts in acquiring a skill," it points out, "You can't acquire it simply by reading textbooks or listening to lectures." *Education Dept., National Assn. of Manufacturers.*

For free copy circle No. 10 on postcard p. 93

Abrasive wheels

Completely new, a 36-page grinding wheel net price and data book lists rubber and resinoid bonded grinding wheels used by industry. All multipliers are eliminated; the actual consumer net price is shown for all quantities. Scheduled additions for special shapes are adjacent to straight wheel net prices. This eliminates unnecessary cross reference. *Manhattan Rubber Div., Raybestos-Manhattan, Inc.*

For free copy circle No. 11 on postcard p. 93

Lab developments

Late developments in laboratory instrumentation and technique are described and illustrated in industrial literature published by a 105-year-old instrument maker. It describes lab developments that have turned the graphic arts into graphic sciences. Included are bizarre developments by which printers and lithographers can print with static electricity, magnetism and cathode rays. New equipment covered in the 32-page booklet includes a completely enclosed portable 3 x 2 x 2 1/3-ft lab-within-a-lab for radio-chemistry, metallurgy or delicate instrument assembly. Also described: a new combination stirrer-&-hotplate; new reagents, including a high-safety chlorinated solvent; new developments in microscopy, pH meters, and partition-chromatography apparatus. A featurette is an account of the discovery of 2000-year-old electric batteries. *Fisher Scientific Co.*

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Many engineers and designers are overlooking the exclusive advantages of aluminum impact extrusions. This advanced metalworking operation offers design flexibility; versatility of alloys; draft free, close tolerance parts requiring minimum machining; smooth surfaces; and significant savings in man hours, machining, and material.

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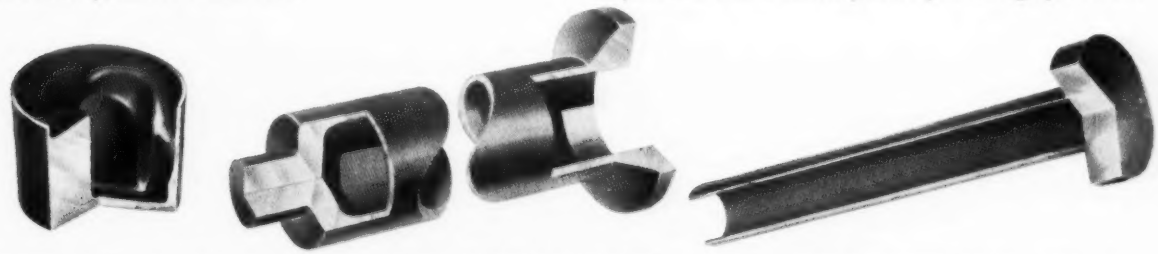

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TUBE SUPPORT provides solid head on one end of tube. This unique aluminum impact extrusion offers the most economical fabrication method for a support tube application without sacrificing high physical properties. Aluminum impact eliminates considerable machining, offers maximum design versatility. Available in a range of sizes and alloys.

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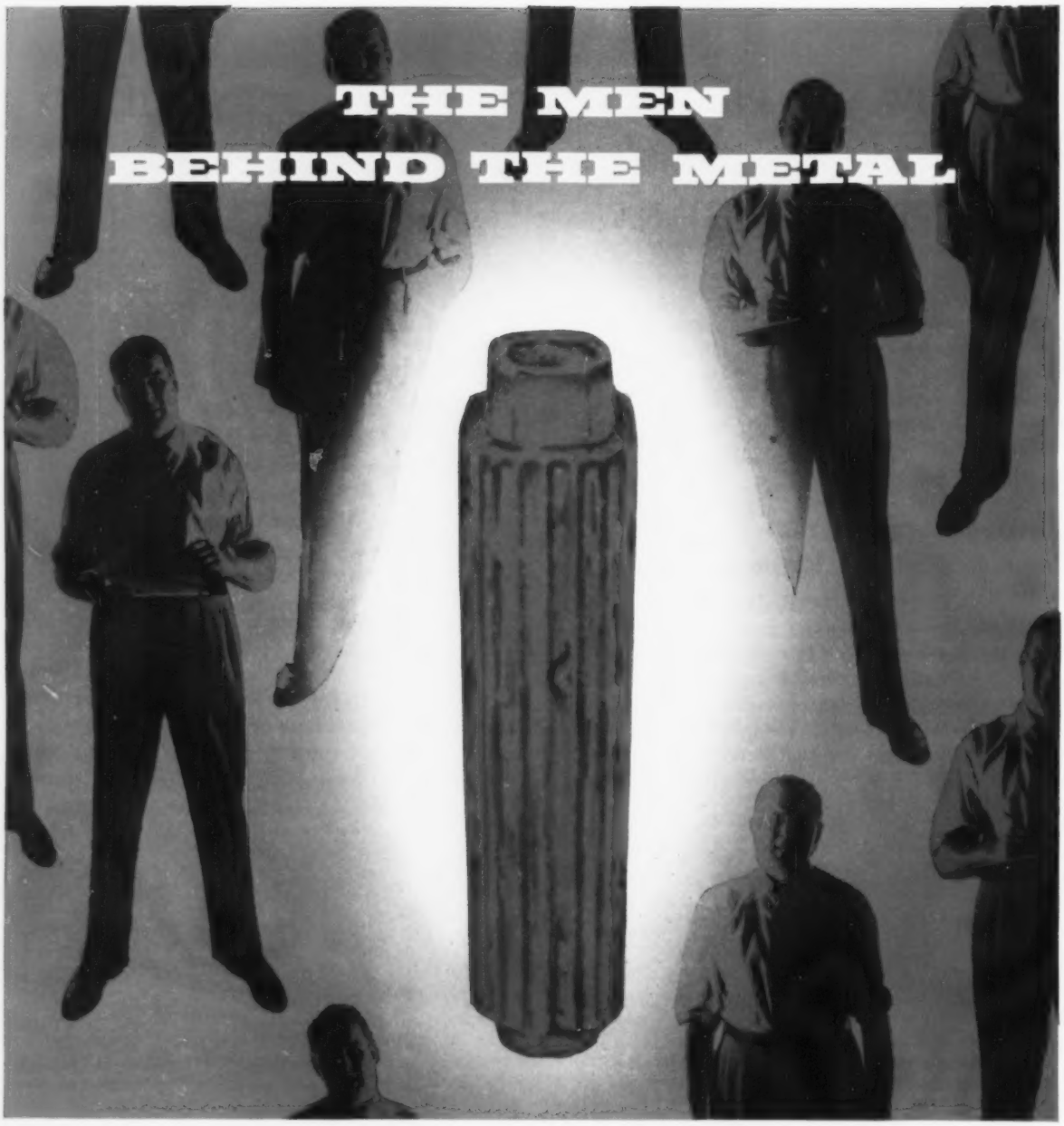

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FREE TECHNICAL LITERATURE

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This section starts on p. 88.

Rectifiers

Small high current silicon rectifiers are analyzed in a new brochure. The new silicon rectifiers are capable of handling 10-kw in a three phase bridge circuit. *General Electric Co.*

For free copy circle No. 13 on postcard

Furnace control

Information is contained in a new bulletin on a furnace pressure control system. It describes the application of an Electronic instrument to furnace pressure control through a transducer that senses pressure changes electrically. *Industrial Div., Minneapolis-Honeywell Regulator Co.*

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Combustion analyzer

A new four-page product specification sheet describes a combustion analyzer. This unit indicates pct by volume oxygen and combustibles present in the exhaust gases from all types of boiler and industrial furnaces. Operating and physical characteristics are provided, together with a list of accessories. *Bailey Meter Co.*

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Resistors

Comprehensive data on fixed composition resistors' construction, characteristics, solderability, heat dissipation, color coding, resistance values and tolerances is contained in a dozen page catalog data bulletin. It contains detailed charts and graphs. *International Resistance Co.*

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Teflon

Stock shapes and fabricated parts of tetrafluoroethylene resin are covered in an 8-page brochure now available. It explains how one company's quality controls assure consistant high quality. Applications, properties, uses and design considerations of the Teflon, a duPont development, are listed. *The Polymer Corp. of Pennsylvania.*

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Protected motors

"Total Protection," a new concept in protected enclosures for industrial a-c. motors, is graphically described in a bulletin. Cutaway views show how a motor is designed for applications which formerly required drip-proof or splash-proof motors. Yet, it is guaranteed to operate within a maximum temperature rise of only 40°. *Reliance Electric and Engineering Co.*

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Plastic parts

Fabricated parts and components of vulcanized fibre, phenolite laminated plastic, nylon and combinations of these materials are described in a new booklet. Illustrations show machining operations and products made by one manufacturer. Property and application charts help the designer or engineer select the best grade of these basic engineering materials. The booklet also points out economies that can be effected by buying parts from a company that controls quality from making the materials, through machining to delivery of 100-pct usable parts. *National Vulcanized Fibre Co.*

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Power plants

Organization and working methods of a firm's power engineering department are detailed in a new 12-page bulletin. Uses of detailed, precision scale models and other up-to-date engineering practices are described. *The Fluor Corp.*

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Arc welding

"Power Supplies for Gas Shielded Metal Arc Welding" details a study which indicates that a constant-voltage transformer-rectifier with automatic regulations for fluctuations in line voltage is the best general purpose machine for the inert-gas-shielded metal arc welding process. *Air Reduction Co.*

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Electric Tools

A 32-page 1957 catalog describes 69 portable electric tools and kits with over 400 accessories. It includes over 150 pictures of tools and their uses with complete specifications for electric saws, sanders, drills, planes, routers, shapers, combination tools, grinders, hedge shears and grass trimmers. *Porter-Cable Machine Co.*

For free copy circle No. 22 on postcard

Gas truck

Gasoline and LP-gas powered industrial lift trucks are covered in a new brochure. It includes key features and specifications on trucks from 2000 to 10,000-lb in capacity with cushion or pneumatic tires and with torque transmission, fluid coupling or straight dry disc clutch. *Yale & Towne Mfg. Co.*

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Ventilation

Corrosion-proof ventilating and exhaust systems are the subjects of a 12-page publication. The literature covers thermoplastic corrosion-proof centrifugal fans, ducting and fittings, and hoods. A six-page section is devoted to a discussion of polyethylene and nonplasticized polyvinyl chloride centrifugal fans. *American Agile Corp.*

For free copy circle No. 24 on postcard

Plate shear

An eight page catalog describes a hydraulic plate shear. It includes data on controls, construction and dimensions. *Pacific Industrial Mfg. Co.*

For free copy circle No. 25 on postcard

Gear cutting

How stainless steel gears are cut to within ten seconds of angular error at Sperry Gyroscope Co. is the subject of literature now available. The close gear cut accuracy is attributed to the use of a new hobbing machine, said by the publication to cut the world's most accurate gears. *Scully-Jones & Co.*

For free copy circle No. 26 on postcard

Grinding

Difficult and unusual surface grinding applications are graphically described in a new booklet. It contains 14 illustrated grinding case histories. Included are surface grinding applications being performed by automotive plants, machine tool builders, makers of tool steel products and other metalworkers. *Mattison Machine Works.*

For free copy circle No. 27 on postcard

Welder

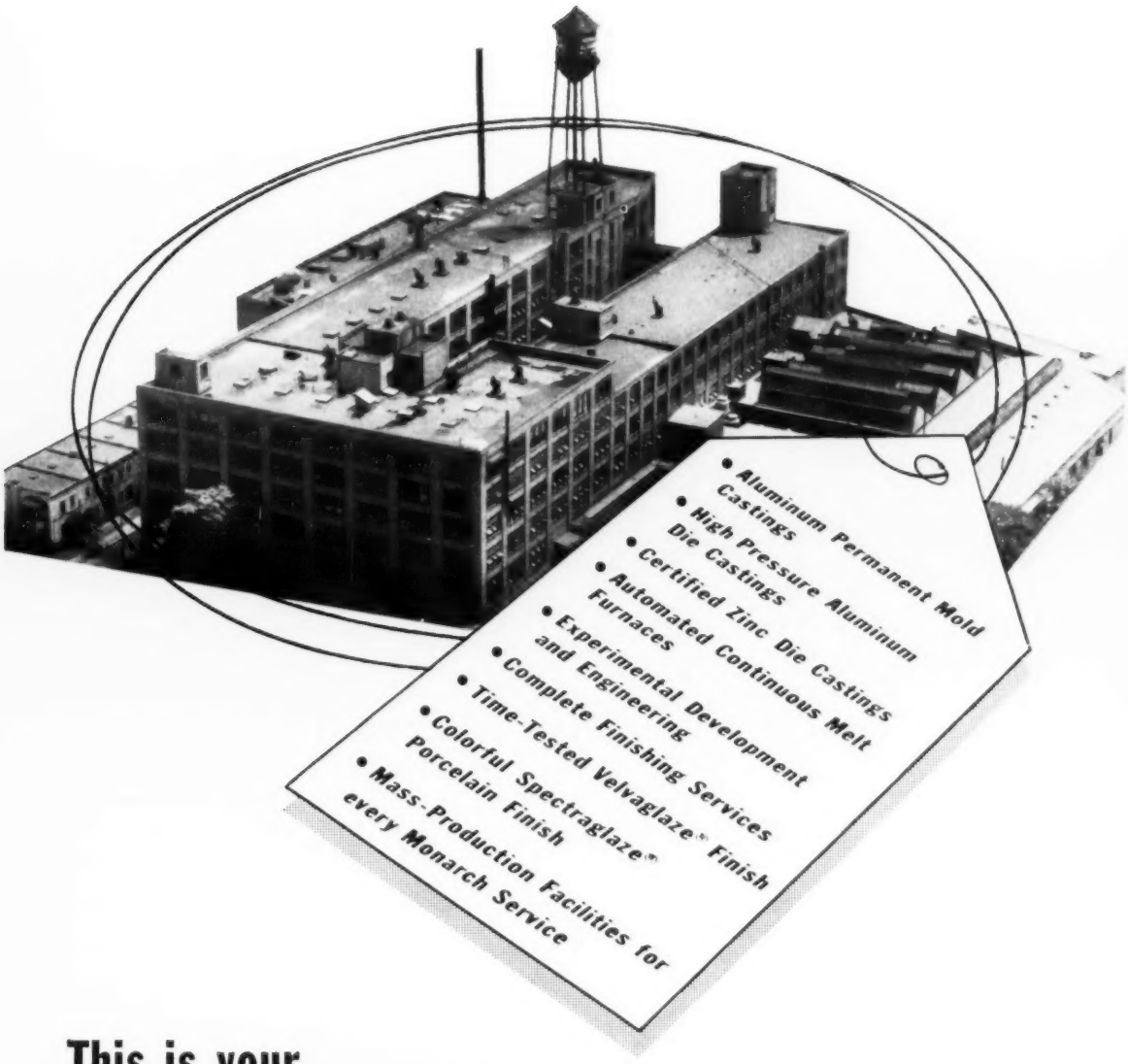
A size 3-½ press welder is described in a bulletin now obtainable. The new type welder meets welding requirements between RWMA standard sizes 3 and 4. Various styles of the welder are equipped with modified tooling for specific welding requirements. 250 or 450 KVA single phase transformers or Tri-Phase power packs supply the welding current. Maximum welding force rating is 7,500 to 12,000-lb. It is designed for hydraulic or compressed air operation. *Taylor-Winfield Corp.*

For free copy circle No. 28 on postcard

Casting specifications

A new summary of steel castings specifications includes all specifications recommended for commercial, railroad, federal and military use *Steel Founders' Society of America.*

For free copy circle No. 29 on postcard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QUANTITY PRODUCTION OF GREY IRON CASTINGS

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RESEARCH: Metal "Whiskers"

Pulling apart perfect iron and silicon crystals allows new insight on forces which bind atoms together . . . Studying tensile strength of "whiskers" measures these forces.

Highly pure and perfect metal crystals enable new insight into forces which bind atoms together.

In a paper delivered at the American Assn. for the Advancement of Science Dr. R. L. Eisner, Westinghouse research physicist, describes a technique for evaluating these forces by measuring the tensile strength of iron and silicon "whiskers."

One of the most accurate methods for pulling apart the tiny crystals measures directly the applied force and the amount of stretch they undergo. Precise, delicate equipment is required because the tiny strands of metal may be 40-millionths of an inch or less in diameter.

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 93. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

In whiskers, a metal exists in a perfect condition. In contrast, any ordinary piece of metal contains countless millions of structural imperfections. Under stress, imperfections govern how and when the metal breaks. They mask any attempt to measure much larger forces which hold the metal atoms themselves together.

Photo dramatically illustrates size of the tiny "whisker."

By conducting tensile tests on whiskers, where these imperfections do not exist, individual atoms pull far enough apart, without breaking, to allow a measure of the interatomic forces.

Under one hundredth of an ounce force pulls the average whisker apart. This is obtained by a lightweight pendulum about 12-ft long.

DO YOU KNOW WHY

31 metal product firms have opened branch plants in

Puerto Rico?

NEW 75-PAGE BOOKLET—FREE TO MANUFACTURERS

Commonwealth of Puerto Rico, Dept. IA-71
Economic Development Administration
579 Fifth Ave., New York 17, N. Y.

Send me "Facts for the Manufacturer" with information about my particular industry.

Name _____ Title _____

Company _____

Address _____

Product _____

The whisker is "clamped" between the pendulum bob and a special "take-up" screw. As the screw is tightened, the whisker pulls the pendulum from its vertical position. Each millionth of an ounce of pull displaces the hanging pendulum exactly the same amount: about one ten-thousandth of an inch.

The stretch of the tiny whisker is measured by reflecting a beam of light from flat optical mirrors attached to the clamps at each end of the whisker, to form an "interference pattern." As the whisker stretches, the mirrors move and cause changes in the pattern similar to the changing "rainbow" colors seen in soap bubbles or thin films of oil. These changes are electronically amplified and analyzed to disclose the amount of stretch. The technique accurately measures changes in whisker length down to less than one millionth of an inch.

Metallurgy:

Strong chromium-iron alloy resists high-temperatures.

Recently tested, a chrome-rich, chromium-iron alloy shows promise as a high-strength, high-temperature material. This is indicated in part two of an air force report of a project aimed at development of a forgeable alloy suitable for jet engine turbine buckets.

During the first phase, a composition of 70 Cr, 30 Fe, 9 Mo, 2 to 3 Ti, and up to ½ Al showed excellent stress-rupture properties at 1500°F. Room-temperature ductility, however, was poor.

Experimental alloys of the same composition are now produced by induction melting charges of commercially available melting stock. These are cast into molds and fabricated by various hot-working methods. Forged bars exhibited remarkable thermal-shock properties up to 2000°F, the report stated.

The report is available for industry use from the Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. It contains 26 pages, costs 75 cents and is catalogued PB 121111.

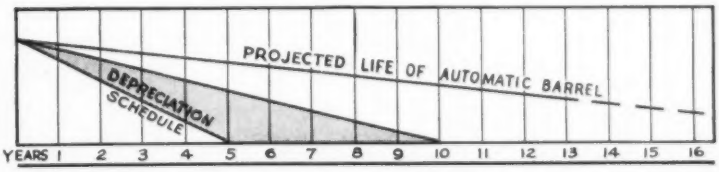
THE FINISHING TOUCH

A HOT IDEA FOR COOL PROFITS

by A. B. HOEFER
Vice-President
FREDERIC B. STEVENS, INC.

Stevens Automatic Plating Barrels Adaptable to Any Situation

IT'S GOOD TO KNOW WHEN YOU ARE INVESTING in a plating machine that Stevens units can be designed so that more than one type of plating can be done on one machine. Also, that changes can be made in the future to meet any specifications you may have. We've changed over a good number of Stevens machines in our time. That's why there are so many Stevens machines in use far beyond their depreciation schedule.



THERE ARE MANY OTHER SAVINGS you can enjoy beyond long life. Stevens Automatic Barrel machines require only one employee to operate the machine. These units are completely automatic, because the open end barrel is loaded when in a vertical mouth-upward position and automatically unloaded by tilting the barrel downward. There are no lids to fasten or unfasten.

POSSIBLE MIXING OF PARTS IS ELIMINATED in the Stevens automatic barrel. Small, special loads can be conveniently run without penalizing the productive capacity of the machine and without the inconvenience of partitioned cylinders. Stevens Automatic Barrel Machines are used for varied processes that include copper strike; copper, nickel, tin, brass, zinc and cadmium plating; phosphating; alrocing; dichromating; cleaning and bright dipping.

THE SIMPLE COMPACT DESIGN of this machine permits production capacities as high as 4,000 pounds per hour. Simplicity of design makes it equally practical to distribute the capacity between two or more machines to provide flexibility in plating thicknesses and production.

Let us give you more details on Stevens Automatic Barrels. Write us today, Frederic B. Stevens, Inc., 1814 Eighteenth Street, Detroit 16, Michigan.

FREDERIC B. STEVENS INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

METAL FINISHING EQUIPMENT AND SUPPLIES FROM CASTINGS OR STAMPINGS TO FINISHED PRODUCT

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General Office: Detroit 9, Mich.

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COLD ROLLED STRIP

Coils • Cut Lengths • All Tempers

FLAT CR SPRING STEEL*

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Hard Rolled Untempered

Coils • Cut Lengths

SHEETS

Cold Rolled • Hot Rolled

Hot Rolled Pickled

Galvanized • Long Terne

Experience-Fitted to Your Job

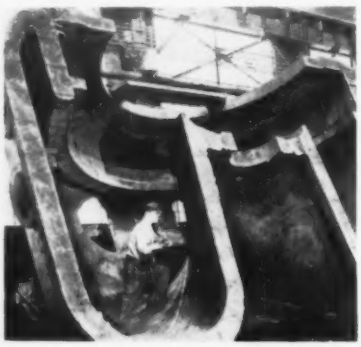
*Stocked only in Detroit

Foundry:

Industrial "dentist" cleans 101,000-lb casting.

Dental work, or its industrial equivalent, is performed on a 101,040-lb iron casting at General Electric's foundry in Schenectady.

While it takes only 3½-minutes



Chipper performs an industrial dental chore on the casting.

to pour such a casting, a period of 20 weeks is needed to prepare the pit and mold, cast, clean, cool and ship the large upper exhaust hood for a 171,000-kw steam turbine. Some 15 men worked on it.

The hood, placed on one end during the chipping operation, stands over 14-ft high, is 22-ft wide and 10-ft deep.

Materials:

Picture making technique uses oven baked plastic.

Photographs can now be printed in industrial areas affected by atomic radiation. This is possible with a new photo-sensitive, oven-baked plastic.

Ordinary Papers Fog

Ordinary photographic papers fog under nuclear radiation. However, this new material is almost unaffected by gamma rays. It can be used in industrial areas made "hot" either intentionally or accidentally.

Developed at Ft. Monmouth Signal Corps lab, the pictures made by the process are clear, durable, waterproof and stronger than ordinary print paper.

Discovered by Ferro Chemical Co., Bedford, Ohio, the process uses no water and a limited amount of equipment. A sun lamp takes the place of an exposure light and an oven replaces trays of hypo and developing solution. An ordinary kitchen oven can be used. Total developing time is five minutes.

Pictures are developed with "the lights on" since the print is sensitive only to ultaviolet.

To produce a plastic print, an aluminum plate coated with a special vinyl is placed under a negative. It is then exposed to strong ultraviolet light for five seconds. The light rays burn an invisible image into the plastic. Baking at 320 to 350°F brings out the picture. In five minutes, the plastic is stripped from the metal as a finished print. The image is imbedded in the plastic assuring long life.

Rolling:

Stainless steel plate weighs-in at 25,275-lb.

An unusually large stainless steel plate is 84-in. wide, 340-in. long and 3⅛-in thick. It weighs 25,275-lb. Allegheny Ludlum Steel Corp. poured the ingot at its Brackenridge Works. A special ingot mold was used to form the molten metal so that the plate could be rolled as a single piece. The ingot weighed in at 49,760-lb.

The plate was finished-rolled by Lukens Steel Co., Coatesville, Pa., on their 206-in. mill.

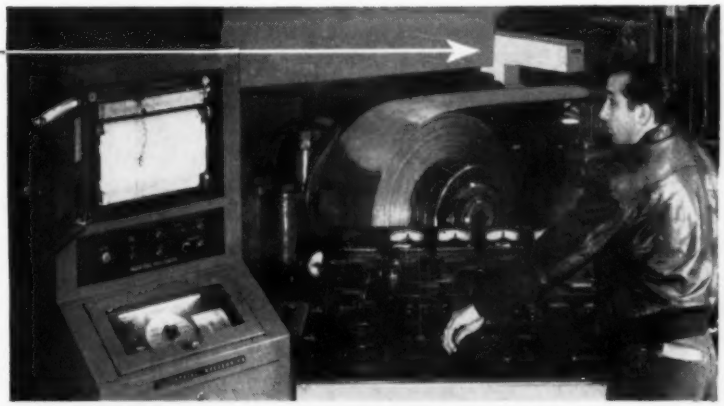
Welding:

Research begins on welding zirconium alloy.

Dr. Ernest Nippes, welding research director at Rensselaer Polytechnic Institute, Troy, N. Y. has opened a new program of research for studies of the welding of Zircaloy 3, a zirconium alloy.

Three resistance welding processes, spot, seam and flash welding, will be utilized in the course of the study. The investigation will continue for a year.

ATOMS-FOR-PEACE HELP ROLL AND CONTROL DSC STRIP



DSC STRIPMANSHIP teams up with *AccuRay** to give strip users a new high in gauge reliability

ACCURAY AT WORK

AccuRay electronic gauge controls are working on one of our Detroit Plant 4-Hi reversing strip mills. The other 4-Hi at Detroit, also the one at our Eastern Plant (Hamden, Conn.) and the big tandem cold sheet mill at our Portsmouth (Ohio) Division are being similarly equipped.

WHAT ACCURAY IS

AccuRay is the trademark name of a nuclear thickness-measuring instrument made by Industrial Nucleonics Corporation, Columbus, Ohio. It is a peace-time application of principles discovered in atom bomb research.

THE GAUGE

THE RECORDER

**Interested in more about AccuRay gauge control . . . or about any DSC service? Just call your nearest DSC Customer "Rep"*

WHAT ACCURAY DOES

This gauge measures, records and controls the thickness of steel as well as other materials. It does this continuously and automatically while the product is being made . . . and without touching it.

HOW ACCURAY WORKS*

The gauge combines within itself a Strontium 90 radio-isotope (electron emitter) and an electron detector. The strip runs between the isotope and the detector without touching either.

The detector "counts" the electrons passing through the moving strip. The fact that the number of the electrons varies in proportion to the strip thickness is the basis for measuring the thickness.

The detector transmits these thickness variations to a recorder which visibly traces them on a chart in split thousandths of an inch. It also "feeds back" this "information" to electronic controllers which operate the roll screw-down motors on the mill. These motors open and close the rolls to decrease or increase their squeeze on the strip . . . thereby continuously "correcting" the gauge within specified tolerance limits.

WHAT ELECTRONIC CONTROL MEANS TO DSC STRIP USERS

Gauge consistency, within standard or restricted tolerances, is characteristic of DSC STRIP. That, together with job-suited temper and finish, accounts for consistently good performance records . . . even without AccuRay control.

Now AccuRay controls make possible even greater gauge reliability. Users will profit from smoother, steadier, faster production, longer tool and die life, lower end-product costs.

Customer Satisfaction Is Our Business

DSC MILL PRODUCTS, PORTSMOUTH DIVISION, PORTSMOUTH, O.

Hot Rolled and Cold Rolled Sheets • Low and Medium Carbon Manufacturers' Wire • High Carbon Specialty Wire • Aluminum Cable Strand Reinforcement • Rope Wire • Tire Bead Wire • Welded Wire Fabric

DETROIT MILL DIVISION, DETROIT, MICH.
EASTERN MILL DIVISION, HAMDEN, CONN.

Cold Rolled Carbon Steel Strip
Flat Cold Rolled Carbon Spring Steel

DETROIT DSC STEEL

DETROIT STEEL CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

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NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 93 or 94.

Crawler crane handles booms up to 100-ft long

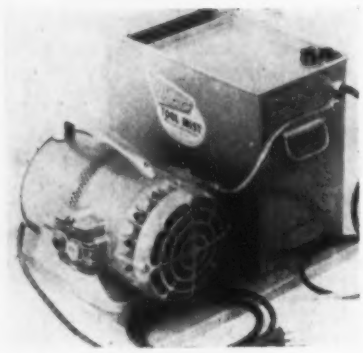
As a crane, this crawler handles booms up to 100-ft long plus 10, 20 or 30-ft jibs. The completely new crane-excavator is in the 1-yd class. Readily convertible to a shovel, dragline, clamshell, crane or dragshovel, it comes in five sizes of crawler mountings. Main operating functions are air controlled. Proper graduation of air pressure gives the operator full-feel over his control levers. Air controlled functions include hoist clutch, crowd and retract or drag clutches, swing and propel clutches, steering jaw clutches, digging brakes, swing brakes, swing brake and dipper trip. The model comes with a diesel engine with direct drive or torque converter drive, gasoline engine with direct drive, or electric motor. Simple in design, the crawler has a strong, rigid cast steel revolving frame. Six large conical hook rollers evenly distribute loads between upper and lower works. They ride on a flame hardened cone roller path. The model is also offered as a carrier-mounted crane, according to the manufacturer. *Bucyrus-Erie Co.*

For more data circle No. 30 on postcard, p. 93

Machine tests a wide range of specimen sizes

This multi-purpose compression testing machine does routine and research compression and flexture testing of metals, alloys and other materials. It has a load capacity of 30,000-lb and is accurate to within 1-pct of indicated load. The unit is also available in metric calibration. It complies with ASTM specifications for hydraulic testing machines. Each machine is furnished with a calibration certificate. The working mechanism is enclosed in an attractive two-tone gray steel cabinet. Front and back panels are easily removed for access to the working parts. Two handily placed controls make it easy to operate and adjust. Maximum specimen clearances are 12-in. wide by 18-in. high. This allows a wide range in specimen sizes. The machine requires a floor space of only 28 x 24-in. Over-all height is 72-in. Test loads are indicated on a large, easy-to-read dial. This is fitted with a maximum load pointer. The loading rate is adjustable up to 6-ipm. *Soiltest, Inc.*

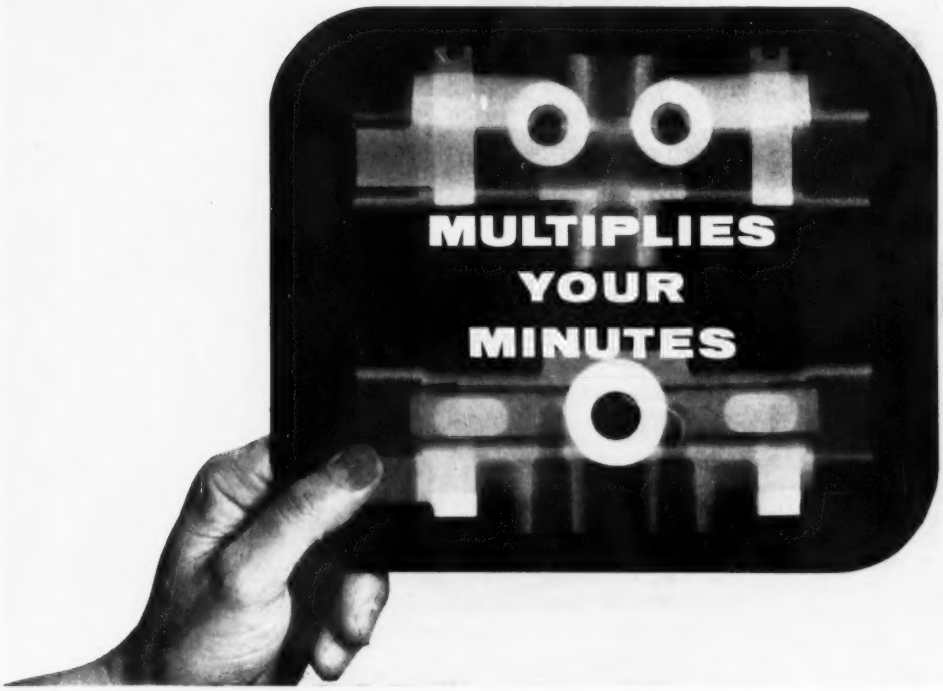
For more data circle No. 31 on postcard, p. 93



Mist coolant unit aims to eliminate dry machining

This mist coolant unit can eliminate dry machining methods on most metalworking equipment. It has a 3½-gal container and a self-contained oil-less air compressor which requires no lubrication. It also has a fan cooled after cooler. Heat of the tool and workpiece is rapidly and thoroughly dissipated by the setup. This is because a sprayed coolant exposes a large fluid surface area. It is thus capable of absorbing much heat, quickly. Advantages listed for the unit include: (1) faster machining speeds, (2) increased tool life, (3) tools stay sharp longer, (4) better finishes, (5) increased output, (6) no coolant pans or splash guards, (7) no rancid coolants, and (8) elimination of harmful dust. It is available in several models. *Lloyd Tool Corp.*

For more data circle No. 32 on postcard, p. 93



New Kodak Industrial X-ray Film, Type AA

When you're faced with the need for quantities of high-quality work, Kodak's new Industrial X-ray Film can be an outstanding find.

Because of its greatly increased speed, exposure times can be cut, and more production realized with existing x-ray equipment and gamma ray sources.

While this new film ranges up to more than twice as fast, it still has the fine sensitivity characteristics which made Kodak Type A the most widely used x-ray film in industry.

Kodak Industrial X-ray Film, Type AA, extends the service of present radiographic equipment, saves time, produces quality results. Have your x-ray dealer or Kodak Technical Representative show you how.

EASTMAN KODAK COMPANY
X-ray Division Rochester 4, N. Y.

Read what the new Kodak Industrial X-ray Film, Type AA, does for you:

- Reduces exposure time—speeds up routine examinations.
- Provides increased radiographic sensitivity through higher densities with established exposure and processing technics.
- Gives greater subject contrast, more detail and easier readability when established exposure times are used with reduced kilovoltage.
- Shortens processing cycle with existing exposure technics.
- Reduces the possibility of pressure desensitization under the usual shop conditions of use.

Kodak
TRADE-MARK

Attachment drills holes 3-in. deep in concrete in 30-seconds

Pneumatic impact action for high-speed drilling in concrete, brick or masonry can be obtained with any ¼-in. electric drill by means of a rotary impact masonry drill attachment. It is 6-in. long by 1½-in. diam. It drills ½-in. holes 3-in. deep in concrete within 30-seconds. The attachment employs a 25-lb pre-loaded spring and two rotating cams to provide two blows per revolution. The unit, which may be chucked to any ¼-in. electric drill, develops approximately 90,000-fpm impact force. Lightweight (1½-lb), it is recommended for close-quarters work where it is normally difficult to apply great pressure. Any standard carbide drill can be used, including: ¼, ⅜, ½, ⅝, ¾ and ⅞-in. sizes. The standard collet takes a ½-in. drill shank; sleeve bushings allow it to take ¼ and ⅜-in. shank diameters. *Power Tools Corp.*

For more data circle No. 33 on postcard, p. 93

Hoppers make parts conveniently available to assemblers

Developed in conjunction with four major appliance manufacturers, this small parts assembly feeder makes parts conveniently available to workers. It also makes them easy to grasp. They can be combined to fit parts requirements of practically any assembly installation. Parts hoppers mount side-by-side and in various heights on a rack, putting all parts within reach of the assembler. In addition, all units are easily removed for reloading. Both curved and straight racks are available in varying sizes. Because the hoppers stack firmly atop one another, use of a rack is optional. Hoppers are tapered, with narrowest width in front, forming a natural arc when several are placed side-by-side. A stepped insert in the hopper bottom controls the parts flow rate. Of bright aluminized finish and sturdy steel construction, the insert also improves visibility inside the unit. They also come with sponge rubber bottoms, as a special accessory. *Chas. Wm. Doepke Mfg. Co., Inc.*

For more data circle No. 34 on postcard, p. 93

"DAVIS" KEYSEATER

Low in Cost. Durable. Easy to operate.
Table adjustable for straight or taper keyways.
Three sizes. Keyways 1/16" up to 1".

DAVIS KEYSEATER CO.
400 Exchange St., Rochester 8, N. Y.

ARMSTRONG Drop Forged **EYE BOLTS**

Drop forged from the best mild steel, heat treated to increased tensile strength and proof-tested to 50% beyond rated "safe working load," ARMSTRONG Eye Bolts are strong, dependable and safe. Blank or threaded, "Plain or Shoulder" patterns. 15 standard sizes and special lengths. Write for Catalog.

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CHUCKING MACHINES
Four, Five, Six, Eight Spindles • Work and Tool Rotating Type
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

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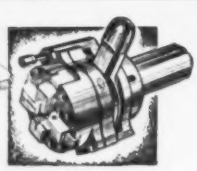

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

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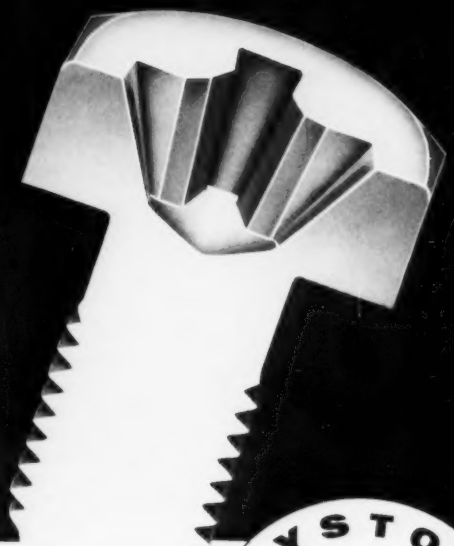
VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland), OHIO

It couldn't be done...

So they did it...in 2 blows



KEYSTONE XL WIRE STUDY

Great Lakes Screw Corporation

and KEYSTONE XL Heading Wire

"We want a door hinge bolt that won't break off in a collision—that we can drive faster—that's cheaper, yet higher in quality," said the automotive engineers.

"Can do," replied Great Lakes Screw Corporation, Chicago, Illinois.

This required an exceptional flow of material in both blows—the first blow cones the head, the second drives in the recess and mushrooms the head to specification. Tough assignment? Not with Keystone "XL" Heading Wire! Because of "XL's" consistent *flowability* and unvarying uniformity, Great Lakes makes long runs of these cold headed parts, producing them precisely on schedule with a minimum of rejects.

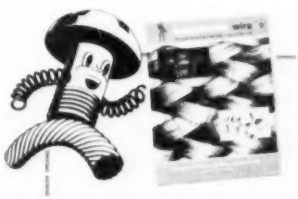
If you, like Great Lakes Screw Corporation, have difficult heading operations, we invite you to call your Keystone representative.

Our service includes close counsel and analysis of your wire requirements. Tell us how we can serve you.

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE

WIRE FOR INDUSTRY



KEYSTONE STEEL & WIRE COMPANY
Peoria 7, Illinois

Mail coupon for free booklet—*COLD HEADING FACTS!* Discusses methods, technical facts, wire requirements and other data.

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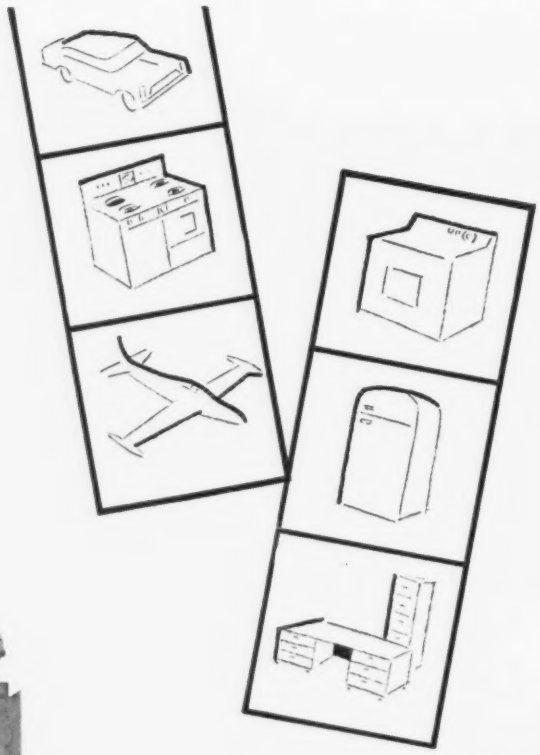

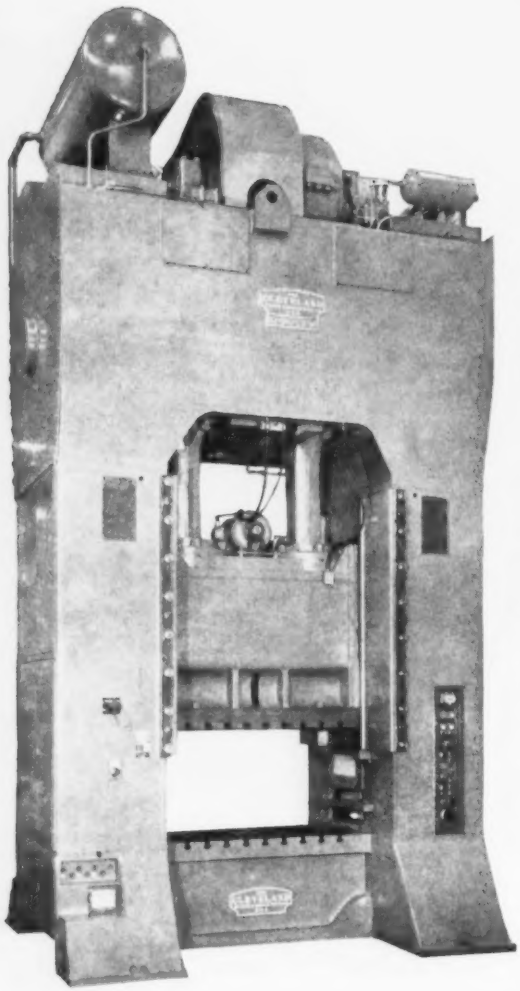

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Greater Strength • Lasting Accuracy • Fast, Accurate Slide Control

As a manufacturer of Automotive, Aviation, Appliance and Office Equipment parts, you're fully aware of the importance of dependable, economical press equipment in the production of volume stampings. We think that you, like many other leading manufacturers, will find many advantages in new Cleveland Presses.

Here's why

Modern Cleveland Single Point, Two Point and Four Point Presses are designed to give you greater strength for lasting accuracy—with reduced weight. Look at the Cleveland Two Point Press shown here. You'll find these important improvements incorporated for greater operating efficiency.

- The Dependable (patented) Cleveland Clutch is arranged with combination clutch and motor control for fast, accurate slide operation.
- Separate automation control is provided for auxiliary feeding devices.
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- Die space is lighted from both sides for greater operator visibility . . . faster, easier die adjustment.
- Fool-proof safety blocks are chained to disconnect plugs.

There are 11 types of Cleveland Presses in a wide range of sizes. One of these is sure to be your answer for lower stamping costs. Just write or call today!

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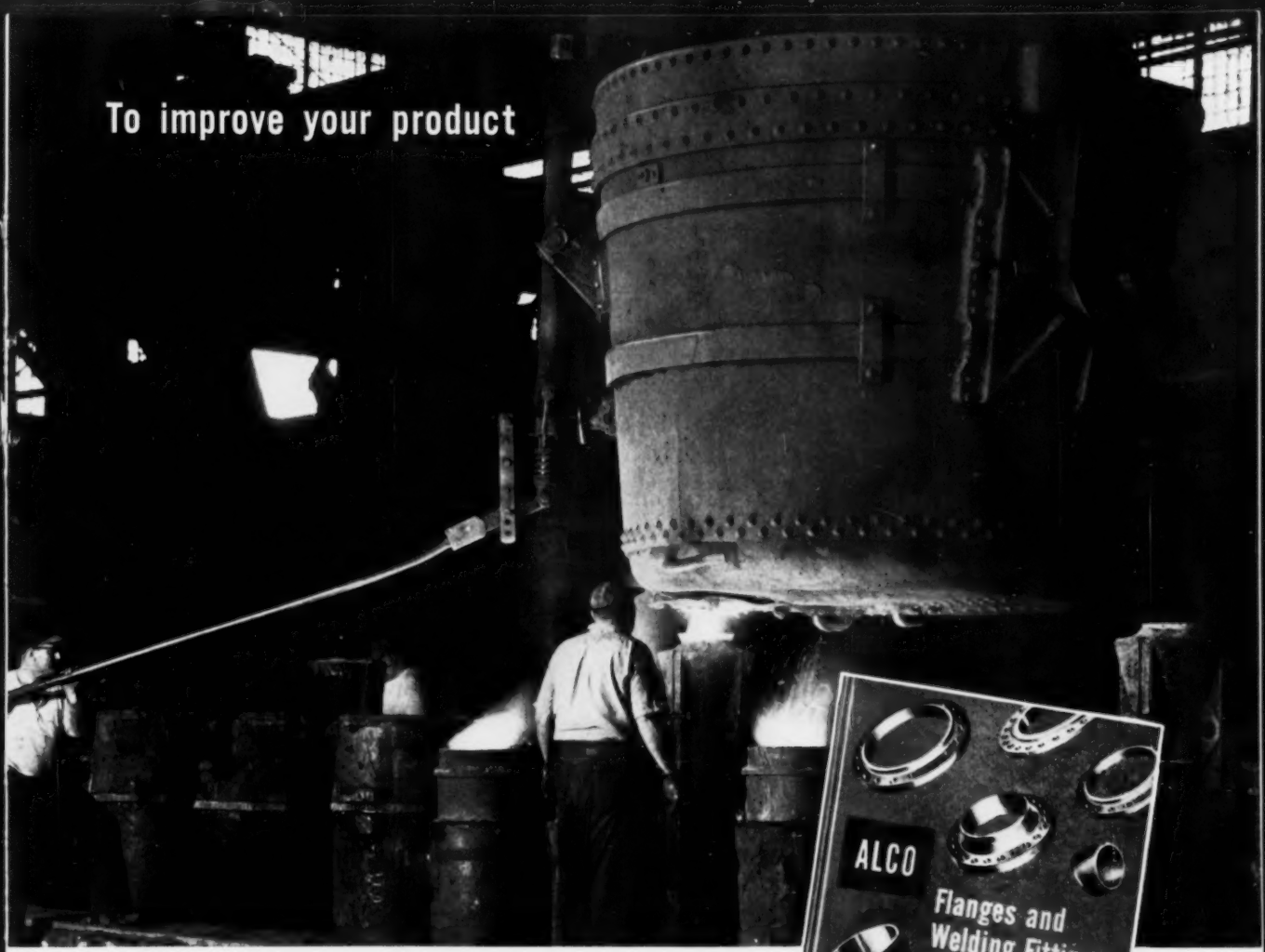
Power Presses • Fabricating Tools • Punching Tools and Dies

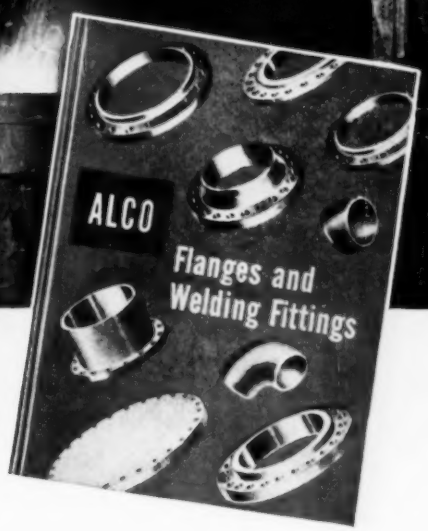
East 40th and St. Clair Avenue, Cleveland 14, Ohio

Offices at: New York • Chicago • Detroit • Philadelphia • East Lansing

THE CLEVELAND PUNCH & SHEAR WORKS CO.

Established 1880





ONLY ALCO STEEL GOES INTO ALCO FORGED FLANGES

ALCO's own open-hearth furnaces provide steel for ALCO flanges; result is exact steel to fit your requirements, high uniformity of all flanges

At ALCO, to provide you with quality forged flanges of high uniformity and exact chemistry, flange crafting becomes an art. The end result is savings to you in preheat, welding or postheat operations, and the knowledge that you've bought the best.

ALCO's own open-hearth furnaces are the basis of the art. The steel ingots cast from them contain the results of long experience and infinite attention – qualities that are so important for high uniformity in a forged product. Not only that, but ALCO's production of its own steel assures you of prompt delivery.

ALCO flanges are available in standard sizes and types from 18-in. OD to 145-in. OD. Stocks are maintained in Latrobe, Pa. and Beaumont, Tex. "Specials" are produced on order and quickly. Your nearest ALCO representative will give you complete information, or mail us the coupon. We'll be happy to send you our catalog.

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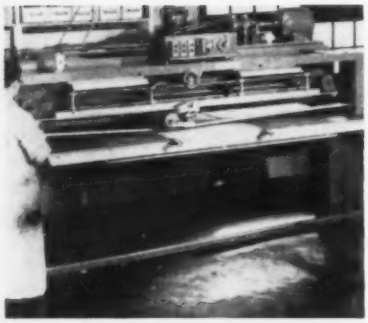


Automatic stroke unit polishes mill sheets

Stainless steel fabricators whose production does not warrant the purchase of a wide belt sheet polisher may now use a hydraulic automatic stroke polisher to polish either 2B roll mill sheets or formed flat surfaces to an equivalent #4 finish or better. The model employs a hydraulic system which powers a traveling head at 80 to 90, 8-ft strokes per minute, with longer strokes possible. A buff roll mounted on the traveling head backs up the 6-in. wide abrasive belt with a "soft" pressure that gives a uniform finish. The stock table reciprocates under the belt with grind pressure, either by manual or air pressure control. The scratch pattern created is longer than mill-furnished standard #3 or #4 finishes, but more approximates the final finish which a fabricator ships on his product. The unit can be built to accommodate any length or width capacity. *Curtis Machine Div., The Carborundum Co.*

For more data circle No. 35 on postcard, p. 93

"...if it's Miller you know it's the finest..."

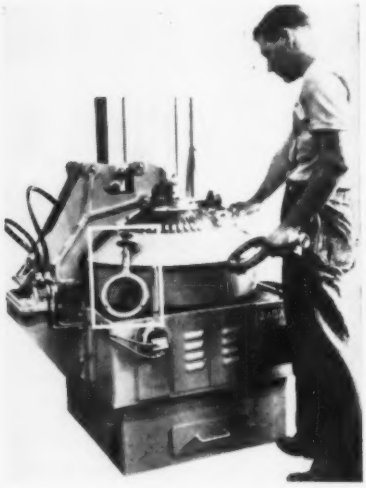
Wherever industry exploits the greater profit possibilities of arc welding processes, Miller selenium rectifier type dc welders have earned re-order respect.

Adapted by design to widest range of specialized and automatic applications, the Miller SR series is offered in single or duplex models of from 200 to 1200 amperes with 60% duty cycle ratings. Lowboy units (27½" high) for stacking.

miller ELECTRIC MANUFACTURING CO., INC.
APPLETON, WISCONSIN
distributed in Canada by CANADIAN LIQUID AIR CO., LTD. Montreal

Multiple drill setup

Circular hole patterns are drilled in cast iron gas burners with this radial drilling machine. A total of 68 holes, 34 simultaneously (two passes), are drilled at a 45° angle. The diameter of the holes is ⅛-in. The operator loads an air actuated clamping fixture on an index table. The drill head is fed automatically,

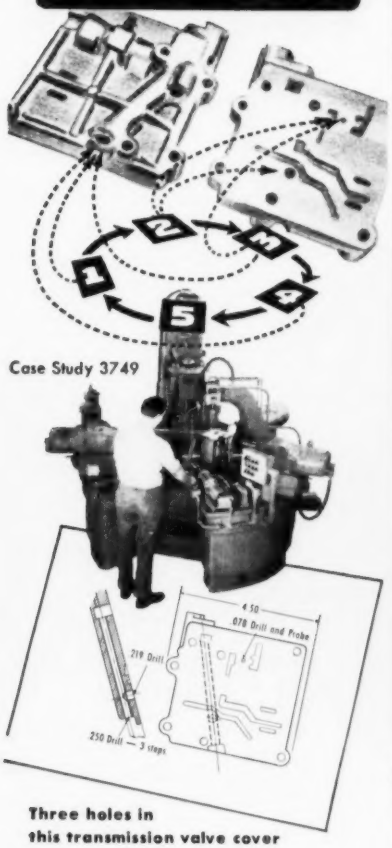


the drills being gear driven into and out of the burner by cam feed electrical control. When the drills retract, the operator indexes the part to drill the other half of the circle. The drilling cycle is repeated and the operator unloads the fixture after the second pass. Up to 135 burners per hour have actually been drilled by users of this equipment. *Zagar, Inc.*

For more data circle No. 36 on postcard, p. 93

drilled and probed automatically in one chucking on a

KINGSBURY



Three holes in this transmission valve cover
. . . 5 operations
. . . 350 parts per hour gross

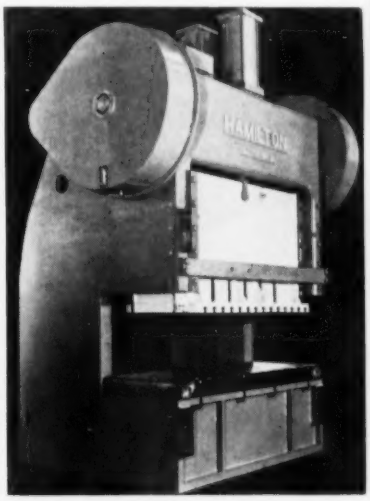
The machine drills three holes in this aluminum die casting. The customer asked us to probe the tiny .078 hole as the best means of inspection. An air-actuated mechanical probe operates at the next station after this drilling. If the hole is not drilled, the probe trips a limit switch which stops the machine.

We pioneered in these indexing automatics and we still think we can build them better than anyone else. They will produce to your specifications. If you have critical high production drilling and tapping jobs, we'd like a chance to show you what we can do. Kingsbury Machine Tool Corporation, Keene, N. H.

KINGSBURY
INDEXING AUTOMATICS
for high production drilling and tapping

Gap presses

Ranging in capacity from 100 to 300-ton a new line of gap presses comes in both single and double crank types. Developed primarily for shallow drawing, forming and blanking duty, they have fed areas large enough to accommodate the more sizeable blanks that are formed into auto-body grille and bumper guards. Exceptionally rugged welded steel construction of both frame and slide assures low deflection, strength and rigidity. Gears, both main and intermediate,



run in oil to afford positive lubrication. Presses incorporate a pneumatically-operated flywheel brake, pneumatic clutch with electric control system and pneumatic counterbalance. Motorized slide adjustment is accomplished through barrel type screws. These remain vertical at all positions of the stroke. Mechanical interlocking between clutch and brake offers optimum performance and safety. *Hamilton Press Div., Baldwin-Lima-Hamilton Corp.*

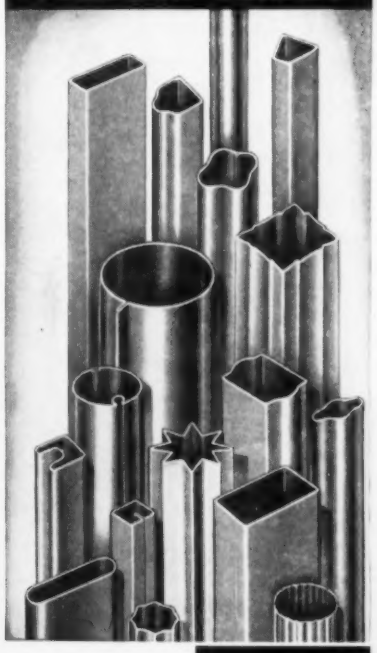
For more data circle No. 37 on postcard, p. 93

Fume ducts, hoods

Corrosion resistant plastic fume ducts and fume hoods are fabricated of a thermo-setting plastic material combined with glass or other synthetic fibres. Ducts and hoods can be produced to virtually any required shape. The combina- any required shape. *The Ceilcote Co.*

For more data circle No. 38 on postcard, p 93

COLD ROLL FORMING TUBULAR SHAPES



Among the wide variety of things you can make on a Yoder Cold Roll Forming machine are round, square, oval, rectangular and other tubular shapes, such as illustrated. The seams may be open, lapped, butted, dovetailed, interlocking, etc.—as shown in the drawing.

Millions of feet of such unwelded tubular shapes are made from coiled strip for conductor pipe, bedsteads, lamp stands, window channel, wiring raceways, carrying rods, etc. Production ranges from 20,000 to 50,000 feet per day, with only one operator and a helper.

Yoder offers you the cooperation of their engineering staff for designing and adapting their cold roll forming machines, auxiliaries, and tooling, for the low cost production of structurals, mouldings and trim, panels, tubular and other shapes, to meet individual needs.

The Yoder Book on Cold Roll Forming is a complete, illustrated text on the art and the equipment needed for performing a variety of operations which can be combined with cold roll forming, at little or no extra labor cost. A copy is yours for the asking.

THE YODER COMPANY
5510 Walworth Ave. **Cleveland 2, Ohio**

YODER
COLD-ROLL FORMING MACHINES

WHAT'S AHEAD...

in steel service and supply

NEW STEELS—Dozens of new sizes and new types of steel have been added to Ryerson stocks in recent weeks—or will be added in the immediate future. Among these products are:

- New Type 202 Allegheny stainless sheets in more gauges
- 8620 alloy plates
- Cold finished leaded Rytense bars (medium-carbon manganese steel)
- Rycut bars (leaded alloy) in greatly increased size ranges
- A west coast stock of fluid power tubing (including hydraulic fluid line tubes to JIC *and* AMS-5050 specs.) previously carried only at our eastern and midwest plants
- Leaded C1141 in cold finished rounds

These are just a few of the additions that make the world's largest steel stocks even larger and make steel buying quicker and more convenient.

NEW QUALITY SAFEGUARDS—A quality control system even more comprehensive than before includes among many new safeguards:

- A more scientific color code that makes steel identification more error proof
- Tolerance control of tubing for cylinder applications that allows you to order more accurately to O.D. and *I.D.* instead of to the customary O.D. and wall

In all, scores of controls will assure the dependable quality of Ryerson steels in 1957.

STEEL SUPPLY OUTLOOK—Demand for most thicknesses of carbon steel plates, heavy structurals and flat rolled 18-8 stainless will undoubtedly continue to exceed supply—but *all* other steels are in good supply at Ryerson and should remain in good supply during the entire year.

STEPPED-UP SERVICE—In 1957 better than five out of every six orders for steel from Ryerson stock will be shipped within 24 hours—and when emergency demands we can send steel on its way to a customer in an hour or two. Service in the Indianapolis and Charlotte areas will be further improved with the completion of new Ryerson plants in these cities during 1957. And we are enlarging and modernizing—adding new equipment—from coast to coast so that we may always be able to supply the steel you need, exactly when you need it.

So here's our steel-service pledge to you for 1957—an even wider selection of steels, even more safeguards to assure dependable high quality, and service that always meets your requirements—now and throughout the year.

RYERSON CERTIFIED QUALITY

RYERSON STEEL

In stock: Carbon, alloy and stainless steel . . . bars, structurals, plates, sheets, tubing, reinforcing bars, machinery & tools, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

The Iron Age SUMMARY . . .

Lag in automotive eases cold-rolled sheet . . . But books are full for all of first quarter . . . Tight money is a factor in strict inventory control methods.

The Detroit Mystery . . . The so-called mystery of "what's happening in Detroit" can be explained by these factors: disappointing sales of medium priced cars aggravated by strict inventory control measures. These are responsible for much of the lag in automotive steel buying.

The result is a slight easing in the market for cold-rolled sheet and strip. Even so, this easing can not be characterized as a soft market. It's generally conceded that steel order books are filled for the first quarter.

The lagging demand for automotive sheets and strip has caused some confusion in rolling mill schedules and order books. But open tonnage caused by deferments has been readily snapped up by other consumers.

Tight Buying Methods . . . The close-to-the-chest steel buying practices in Detroit are founded on both necessity and tighter business methods. Automotive steel inventories were in good shape when the industry went into production of '57 models. Then, production hardly got off the ground in the last quarter of 1956. The new year brought, instead of expected carryovers, unexpected long inventories.

Automakers are now insisting on shipments of specified items within weeks and are putting pressure on producers for regular deliveries. One leading auto producer has set up a 20-day inventory program.

This razor-sharp purchasing indicates that automakers are sure of their ground in view of (1) continued steel labor peace and (2) determination of steel to continue expansion.

Odds are with the automakers. They believe they can get along on a minimum of inventory geared closely to output. There is an element of risk in the possibility of a sudden upsurge of sales in the spring. If this happens, it will play havoc with mill order books and schedules.

Tight Money a Factor . . . Another influence on the steel market is tight money. Many steel users—particularly small companies—are reluctant to tie up a lot of money in steel inventory. Money is too hard to come by. So they prefer to order in small quantities—more often.

But this strategy is possible only in the case of some steel products. Other products are even tighter than money. These include plates, structural shapes, and pipe.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,548	2,535	2,511	2,293
Ingot Index				
(1947-1949=100)	158.6	157.8	156.3	147.0
Operating Rates				
Chicago	98.0	97.0	102.0	98.5
Pittsburgh	100.0	100.0*	101.0	103.0
Philadelphia	104.0	104.0	105.0	102.0
Valley	98.0	100.0*	99.0	98.0
West	99.0	100.0	101.0	102.0
Detroit	105.0	105.0	100.0	103.0
Buffalo	105.0	105.0	105.0	105.0
Cleveland	94.0	99.0*	104.0	102.0
Birmingham	97.0	95.0	94.0	96.0
S. Ohio River	100.0	04.0*	91.0	88.0
Upper Ohio R.	101.0	103.0*	103.0	103.0
St. Louis	100.5	96.0	99.0	99.0
Northeast	0.0	48.0*	100.0	85.0
Aggregate	99.5	99.0	102.0	98.0

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.622	5.622	5.622	5.174
Pig Iron (Gross Ton)	$62.90	$62.90	$63.04	$59.09
Scrap, No. 1 hvy (gross ton)	$59.17	$60.83	$65.17	$53.17
Nonferrous				
Aluminum ingot	27.10	27.10	27.10	24.40
Copper, electrolytic	36.00	36.00	36.00	43.00
Lead, St. Louis	15.80	15.80	15.80	15.80
Magnesium ingot	36.00	36.00	36.00	33.25
Nickel, electrolytic	74.00	74.50	64.50	64.50
Tin, Straits, N. Y.	101.00	99.50	160.00	104.50
Zinc, E. St. Louis	13.50	13.50	13.50	13.50

*Revised

Bases Go Up on West Coast

Increases averaging $1 per ton are made on some products . . . Pig iron, some billet prices included among those raised . . . Boosts in extras continue.

◆ AN INCREASE in base prices —the first by a major producer —has been announced by Kaiser Steel Corp.

The boosts—averaging around $1 a ton—are described by Kaiser as an adjustment bringing company's prices in line with those of Eastern suppliers who advanced prices on West Coast shipments after recent rail freight increases.

There was no immediate announcement from other West Coast producers on price revisions.

Kaiser raised prices by $1 per ton on plate, standard structural shapes, wide flange beams, hot and cold-rolled sheet, hot-rolled strip, and continuous and electric weld pipe. Cold-rolled strip went up $2 per ton, while basic and foundry pig iron increased 50 cents per ton. Bar prices at Kaiser were not changed. (New prices, effective January 11, are published on the pages following.)

Base prices on carbon steel and reinforcing bar were advanced, however, by another West Coast producer. Effective Jan. 10 Pacific States Steel Co. raised prices on these products by $5 per ton at its Niles, Calif. basing point.

Another producer — Allegheny Ludlum Steel Corp—raised base price on the firm's special high nickel electrical alloys. Increased cost of nickel and other raw materials was cited as making the change necessary. The company has also announced changes in size extras on c-r electrical alloy steel strip, coils and cut lengths. No changes have been made in extras on bars, sheets, plate, wire and rod.

Allegheny's base price increases for the nickel electrical alloys include an advance of 6 to 11 cents per lb on those grades of plate, sheet and c-r strip containing from 42 to 79 pct nickel. There are also boosts of 8½ to 15½ cents per lb on alloy grades of bar and cold-finished wire of ½ in. and under containing from 42 to 79 pct nickel.

Youngstown Sheet and Tube Co., effective Jan. 12, advanced alloy grade extras for molybdenum and vanadium bearing steels. Increases were for semi-finished products, hot-rolled alloy bars, sheet, strip and plate.

Continued lack of strong automotive ordering of cold-rolled sheet is keeping the supply situation, while far from easy, in marked contrast with that of most other mill products.

In one market area the automakers are expected to take only about 80 pct of their normal March requirements. What's more, they're insisting on regular deliveries and asking for specified scheduling on specified products.

It's important to note, however, that most tonnages deferred by the auto firms are being snapped up by small consumers when the mills offer them. Still, cold-rolled sheet isn't as strong as it was expected to be, as auto builders buy only what they need for current production levels.

Eastern mills describe customer inventories in sheet as high and their statements that business could be better are backed up by reports from the Midwest. It's indicated there that some Eastern mills are coming into the market looking for cold-rolled sheet business. In some cases, they seem to be scouting around for hot-rolled sheet orders, also.

Jones & Laughlin Steel Corp. has revised extras on h-r plate and floor plate. Wisconsin Steel Div., International Harvester Co., has changed extras on h-r plate.

SHEET AND STRIP . . . While strip market continues good, market for sheet, particularly cold-rolled, is very slow. March tonnages for the auto producers will be about 80 pct of their normal ordering pace in the **Cleveland** area. Sheet order deferments from the auto firms are leaving open tonnages in that area, but usually the mills can sell the product after a little looking around. One leading auto producer is described as setting up a 20-day inventory program. Stamping plants reportedly have less than a week's inventory on hand.

Mill salesman in the **Detroit** area don't look for any increase in demand for either sheet or strip until the second quarter.

At **Philadelphia**, hot rolled sheet is most in demand, followed by cold-rolled, with galvanized sheets somewhat loose. Slack business for cold-rolled sheet seems to be drawing Eastern producers into the midwest looking for orders. There's some evidence they want h-r orders, too.

Warehouses at **Pittsburgh** and **Chicago** report they're overstocked on sheet.

BAR . . . Despite auto industry deferments, there are full order books at **Cleveland** through March. Second quarter books are now being opened in that area and bar orders are coming in at a good rate.

At **Detroit** cold-drawn and alloy bars are very easy and carbon bars are fast catching up on orders.

Hot-rolled bar is being offered in the 2-4 in. diam range for March delivery at **Chicago.** Cold finished bar continues to show mild strength. Slackness in automotive ordering is having its effect on the bar market, however. Hot-rolled is felt easing in supply.

Purchasing Agent's Checklist

SPECIAL REPORT: How fast-tax veto affects steel expansion and product supply . . . . . p. 31

MARKETING: Why Detroit drags its heels in purchasing steel . . . . p. 37

PRODUCTION: Petroleum industry will want more oil country goods from steel industry . . . . . p. 38

PRODUCTION: Is cold-finished bar market a good business barometer? . . . . . p. 40

Comparison of Prices

(Effective Jan. 15, 1957)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Jan. 15 1957	Jan. 8 1957	Dec. 18 1956	Jan. 17 1956
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.675¢	4.675¢	4.675¢	4.325¢
Cold-rolled sheets	5.75	5.75	5.75	5.325
Galvanized sheets (10 ga.)	6.30	6.30	6.30	5.85
Hot-rolled strip	4.675	4.675	4.675	4.325
Cold-rolled strip	6.870	6.870	6.870	6.29
Plate	4.87	4.87	4.87	4.52
Plates, wrought iron	10.40	10.40	10.40	10.40
Stainl's C-R strip (No. 302)	50.00	50.00	47.50	44.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.95	$9.95	$9.95	$9.05
Tinplates, electro (0.50 lb.)	8.65	8.65	8.65	7.75
Special coated mfg. ternes	9.20	9.20	9.20	7.85
Bars and Shapes: (per pound)				
Merchant bars	5.075¢	5.075¢	5.075¢	4.65¢
Cold finished bars	6.85	6.85	6.85	5.90
Alloy bars	6.125	6.125	6.125	5.65
Structural shapes	5.00	5.00	5.00	4.60
Stainless bars (No. 302)	43.25	43.25	40.75	38.25
Wrought iron bars	11.50	11.50	11.50	11.50
Wire: (per pound)				
Bright wire	7.20¢	7.20¢	7.20¢	6.25¢
Rails: (per 100 lb.)				
Heavy rails	$5.075	$5.075	$5.075	$4.725
Light rails	6.00	6.00	6.00	5.65
Semifinish Steel: (per net ton)				
Rerolling billets	$74.00	$74.00	$74.00	$68.50
Slabs, rerolling	74.00	74.00	74.00	68.50
Forging billets	91.50	91.50	91.50	84.50
Alloy blooms, billets, slabs	107.00	107.00	107.00	96.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.80¢	5.80¢	5.80¢	5.025¢
Skelp	4.225	4.225	4.225	4.225
Finished Steel Composite: (per pound)				
Base price	5.622¢	5.622¢	5.622¢	5.174¢

	Jan. 15 1957	Jan. 8 1957	Dec. 18 1956	Jan. 17 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$66.88	$66.88	$67.76	$63.69
Foundry, Valley	63.00	63.00	63.00	59.00
Foundry, Southern Cin'ti	67.17	67.17	67.17	62.93
Foundry, Birmingham	59.00	59.00	59.00	55.00
Foundry, Chicago	63.00	63.00	63.00	59.00
Basic del'd Philadelphia	66.38	66.38	66.84	62.77
Basic Valley furnace	62.50	62.50	62.50	58.50
Malleable, Chicago	63.00	63.00	63.00	59.00
Malleable, Valley	63.00	63.00	63.00	59.00
Ferromanganese, cents per lb‡	12.75¢	12.75¢	11.75¢	9.50¢
74 to 76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	$62.90	$62.90	$63.04	$59.09
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	*$61.50*	$62.50	$66.50	$54.50
No. 1 steel, Phila. aren	*58.50*	60.50	62.50	55.50
No. 1 steel, Chicago	*57.50*	59.50	66.50	49.50
No. 1 bundles, Detroit	*51.50*	52.50	60.50	47.50
Low phos., Youngstown	*65.50*	66.50	70.50	56.50
No. 1 mach'y cast, Pittsburgh	60.50	60.50	61.50	55.50
No. 1 mach'y cast, Philadel'a	60.50	60.50	59.50	57.50
No. 1 mach'y cast, Chicago	*55.50*	56.50	58.50	55.00
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	*$59.17*	$60.83	$65.17	$53.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.50	$15.50	$15.50	$14.25
Foundry coke, prompt	$18-19	$18-19	$18-19	$16.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	36.00	36.00	40.00	43.00
Copper, Lake, Conn.	36.00	36.00	40.00	43.00
Tin, Straits, New York	101.00†	99.50	106.00	104.50
Zinc, East St. Louis	13.50	13.50	13.50	13.50
Lead, St. Louis	15.80	15.80	15.80	15.80
Aluminum, virgin ingot	27.10	27.10	27.10	24.40
Nickel, electrolytic	74.00	74.00	64.50	64.50
Magnesium, ingot	36.00	36.00	36.00	33.25
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 120→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	64.50	65.00	65.50	66.00	.....
Birmingham *R3*	58.50	59.00*	.....	.....	.....
Birmingham *W9*	58.50	59.00*	63.00	.....	.....
Birmingham *U4*	58.50	59.00*	63.00	.....	.....
Buffalo *R3*	62.50	63.00	63.50	64.00	.....
Buffalo *H1*	62.50	63.00	63.50	.....	.....
Buffalo *W6*	62.50	63.00	63.50	64.00	.....
Chester *P2*	64.50	65.00	65.50	.....	.....
Chicago *I4*	62.50	63.00	63.00	63.50	.....
Cleveland *A5*	62.50	63.00	63.00	63.50	67.50†
Cleveland *R3*	62.50	63.00	63.00	63.50	.....
Duluth *I4*	62.50	63.00	63.00	63.50	67.50†
Erie *I4*	62.50	63.00	63.00	63.50	67.50†
Everett *M6*	.....	65.00	65.50	.....	.....
Fontana *K1*	70.53	71.00	.....	.....	.....
Geneva, Utah *C7*	62.50	63.00	.....	.....	.....
Granite City *G2*	64.40	64.90	65.40	.....	.....
Hubbard *Y1*	.....	.....	63.00	.....	.....
Lone Star *L3*	58.50‡	59.00‡	.....	.....	.....
Midland *C11*	62.50	.....	.....	.....	.....
Minnequa *C6*	64.50	65.00	65.50	.....	.....
Monessen *P6*	62.50	.....	.....	.....	.....
Neville Is. *P4*	62.50	63.00	63.00	63.50	67.50†
N. Tonawanda *T1*	.....	63.00	63.50	64.00	.....
Pittsburgh *U1*	62.50	.....	63.00	63.50	.....
Sharpsville *S3*	62.50	63.00	63.00	63.50	.....
So. Chicago *R3*	62.50	63.00	63.00	.....	.....
Swedeland *A2*	64.50	65.00	65.50	65.50	.....
Toledo *I4*	62.50	63.00	63.00	63.50	.....
Troy, N. Y. *R3*	64.50	65.00	65.50	66.00	70.50
Youngstown *Y1*	.....	.....	63.00	63.50	.....

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. * Add $1.00 for 0.31-0.69 pct phos. † Intermediate low phos. ‡ Add $1.00 for 0.31 to 0.50 pct phos.

Silvery Iron: Buffalo, *H1*, $72.50; Jackson, *J1*, *I4* (Globe Div.), $71.50; Niagara Falls (15.01-15.50), $99.50; Keokuk (14.01-14.50), $110.00; (15.51-16.00), $105.00. Add $1.25 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 14 pct. Add 75¢ for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery 6 pct to 14 pct.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	21.25	22.75	22.25	24.25	—	26.00	38.25	31.00	35.50	—	16.00	27.75	16.25
Slabs, billets	26.00	29.00	27.00	30.25	30.75	32.00	47.50	38.50	44.75	—	20.75	—	21.00
Billets, forging	—	35.00	35.75	36.50	39.50	39.00	59.75	45.25	53.50	30.75	27.25	27.75	27.75
Bars, struct.	—	41.25	42.50	43.25	46.25	46.00	70.25	53.25	62.25	36.25	32.50	33.00	33.00
Plates	—	43.25	44.50	45.50	48.00	48.75	73.75	57.50	67.00	38.75	33.75	35.50	34.50
Sheets	46.75	47.25	49.25	50.00	—	53.25	78.25	63.00	76.25	46.50	38.75	46.50	39.25
Strip, hot-rolled	34.50	37.50	35.75	39.00	—	42.50	66.50	51.50	61.00	—	29.75	—	30.75
Strip, cold-rolled	43.25	47.25	45.75	50.00	—	53.25	78.25	63.00	76.25	46.50	38.75	46.50	39.25
Wire CF; Rod HR	—	39.25	40.25-40.50	41.00-41.25	44.00	43.75	66.75-67.00	50.50-51.00	59.25-59.50	34.50	31.00	31.50	31.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Philadelphia, *D5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M3*; Canton-Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1* New Bedford, Mass. (*.25¢ per lb higher*), *R6*; Gary, *U1* (*.25¢* per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*; Philadelphia, *D5*; Detroit, *R5*; Gary, *U1*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Philadelphia, *D5*; Vandergrift, Pa., *U1*; Gary, *U1*

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*.

Market Downtrend Continues

Most markets continue to decline . . . Jittery market avoids commitment at going prices . . . But frigid weather keeps collections down . . . Composite drops.

◆ A JITTERY SCRAP market continues to drop. Declines show up in most markets as the trade tries to appraise trends of the next few weeks.

Brokers are backing up to avoid present prices and mills are not anxious to buy in any of the markets. Declines in many areas are on the basis of appraisal or brokers' buying prices as mills stayed out of the market.

Apparently bearish talk about the steel market has thrown a scare into the scrap market. Some of the decline is attributed to speculation that the steel operating rate will decline in the second quarter.

This speculation, in turn, is prompted by the skittish auto market, which is now taking the blame for any signs of weakness in the economy.

On the other side, the onslaught of frigid weather has slowed collections to a walk. However, this apparently is not frightening any consumer. Most of them have built up satisfactory inventories, believe they can ride out any seasonal problems that result in poor collections.

Prices are still comparatively high, despite the month-long series of declines. The markets aren't actually weak anywhere and steel operating rates show no indication of a significant decline. After all, order books are full and most products are still tight.

Meanwhile, local activity was at a standstill as most of the leading brokers and dealers journeyed to Miami for the annual convention of the Institute of Scrap Iron & Steel.

As a result of the declining market, THE IRON AGE Composite price dropped from $60.83 to $59.17.

Pittsburgh . . . The market here is in a spotty state. No. 2 heavy melting is reportedly stronger, while best grades show signs of weakness. Late railroad lists show No. 1 railroad heavy melting off $2 and railroad specialties down $1. Low phos has dropped another $2 as consumers continue to resist higher prices. No. 1 factory bundles are down $2 as broker offerings at $70 have been declined by the mills. The drop in railroad scrap has taken some of the edge off No. 1 dealer heavy melting, but the market has not really been tested. Brokers are sitting on orders in hope of a further drop. Bad weather has slowed collections and dealers are not pushing for a sale.

Chicago . . . This market slipped again as local mills dropped offering prices and halted shipments at previous prices in several cases. Alarm had been expressed last week that the market had been depressed too far and might rebound explosively. But the bearish feeling was reinforced early this week when reports of slowing auto activity led brokers to believe that mill operations might slump in the second quarter. Tonnages of scrap moving at the new prices are small.

Philadelphia . . . For the second straight week the price of steelmaking grades tumbled $2. Blast furnace grades were also going for $1 under last week's prices. The price line held steady on railroad and cast grades, with the exception of cupola cast. The dealer buying price dropped $2 on truckloadings, spreading the cupola cast range to $53-56.

New York . . . A $2 drop in steelmaking grade prices was brought on by pressure from purchases in the Eastern Pennsylvania market. Blast furnace grades dropped $1 for the same reason. A purchase of clean cast chemical borings by an area consumer brought this item down $2 to $33-$34.

Detroit . . . Prices of No. 1 and No. 2 grades dropped another $1 on appraisal this week. The market continues to reflect a growing softness here. Dealers are in a selling mood, but are not finding any takers. Local mills are out of the market and may not be back in before the end of the month.

Cleveland . . . Cleveland and Valley markets dropped another $1 on primary and secondary grades based on broker buying. Cleveland is quiet with local mills comfortable. Valley mills are holding off buying because they claim ample surplus. Secondary grades are a glut on the market with most going to Pittsburgh. Mill queries on cars are causing dealers to accelerate shipments to avoid cancellations.

Birmingham . . . Embargoes at several ports are making more scrap available for the domestic market. As a result, weakness is shown in most items except cast. A recent order which first appeared unfavorable has been easy to buy for in view of the lag in export. Electric furnace is softer and most electric furnace grades are down.

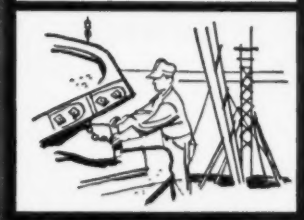
St. Louis . . . Extreme cold weather in the area from which this market draws most of its supplies is causing a drop in movement of scrap. The market is generally quiet, as most brokers are attending the Institute meeting. No. 2 dealer bundles are off $1.50, random length rails and short rails are down $5 and $4.

Cincinnati . . . The market remains quiet with good shipments on orders for the month. The price structure is still somewhat weak and another decline is possible. Local railroad scrap prices are all off $1.

Buffalo . . . Prices are unchanged in a dormant market. Bad weather has slowed activity even more. No sales have been made in more than a week. Scrap meeting in Miami has slowed activity here more than normal.

Boston . . . The market has sagged somewhat. Export is negligible because of lack of shipping and dock space. Outlook is slightly soft, with no immediate increase in activity.

West Coast . . . $59 per ton for No. 1 heavy melting is now the price in all Coast markets. Mills are buying only limited quantities at this all-time high price. Exporting is still strong.



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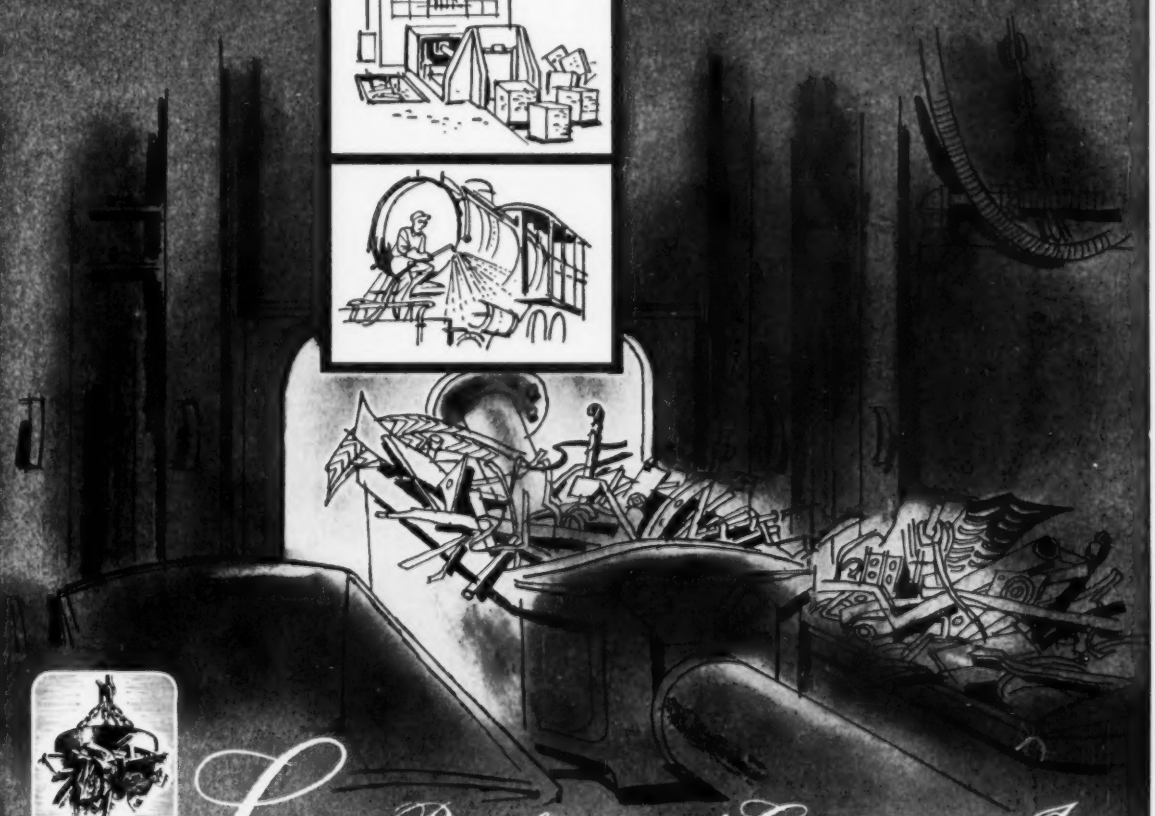

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IMPORT & EXPORT — **LIVINGSTON & SOUTHARD, INC.,** 99 Park Ave., New York, N. Y. — Cable Address: **FORENTRACO**

Scrap Prices *(Effective Jan. 15, 1951)*

Pittsburgh

No. 1 hvy. melting	$61.00 to $62.00
No. 2 hvy. melting	55.00 to 56.00
No. 1 dealer bundles	61.00 to 62.00
No. 1 factory bundles	68.00 to 69.00
No. 2 bundles	49.00 to 50.00
Machine shop turn.	41.00 to 42.00
Mixed bor. and ms. turn.	41.00 to 42.00
Shoveling turnings	46.00 to 47.00
Cast iron borings	46.00 to 47.00
Low phos. punch'gs plate	68.00 to 69.00
Heavy turnings	56.00 to 57.00
No. 1 RR hvy. melting	64.00 to 65.00
Scrap rails, random lgth.	75.00 to 76.00
Rails 2 ft and under	79.00 to 80.00
RR steel wheels	71.00 to 72.00
RR. spring steel	71.00 to 72.00
RR. couplers and knuckles	71.00 to 72.00
No. 1 machinery cast.	60.00 to 61.00
Cupola cast.	53.00 to 54.00
Heavy breakable cast.	51.00 to 52.00

Chicago

No. 1 hvy. melting	$57.00 to $58.00
No. 2 hvy. melting	48.00 to 49.00
No. 1 dealer bundles	58.00 to 59.00
No. 1 factory bundles	62.00 to 63.00
No. 2 bundles	44.00 to 45.00
Machine shop turn.	37.00 to 38.00
Mixed bor. and turn.	39.00 to 40.00
Shoveling turnings	39.00 to 40.00
Cast iron borings	39.00 to 40.00
Low phos. forge crops	68.00 to 70.00
Low phos. punch'gs plate	64.00 to 65.00
Low phos. 3 ft and under	62.00 to 63.00
No. 1 RR. hvy. melting	63.00 to 65.00
Scrap rails, random lgth.	77.00 to 78.00
Rerolling rails	85.00 to 86.00
Rails 2 ft and under	81.00 to 82.00
Locomotive tires, cut	67.00 to 68.00
Cut bolsters & side frames	67.00 to 68.00
Angles and splice bars	72.00 to 73.00
RR. steel car axles	85.00 to 86.00
RR. couplers and knuckles	66.00 to 67.00
No. 1 machinery cast.	55.00 to 56.00
Cupola cast.	51.00 to 52.00
Heavy breakable cast.	48.00 to 49.00
Cast iron brake shoe	48.00 to 49.00
Cast iron wheels	57.00 to 58.00
Malleable	71.00 to 72.00
Stove plate	48.00 to 49.00
Steel car wheels	67.00 to 68.00

Philadelphia Area

No. 1 hvy. melting	$58.00 to $59.00
No. 2 hvy. melting	50.00 to 51.00
No. 1 dealer bundles	58.00 to 59.00
No. 2 bundles	48.00 to 49.00
Machine shop turn.	43.00 to 44.00
Mixed bor. short turn.	43.00 to 44.00
Cast iron borings	43.00 to 44.00
Shoveling turnings	46.00 to 47.00
Clean cast chem. borings	49.00 to 50.00
Low phos. 5 ft and under	63.00 to 64.00
Low phos. 2 ft and under	65.00 to 66.00
Low phos. punch'gs	65.00 to 66.00
Elec. furnace bundles	63.00 to 64.00
Heavy turnings	54.00 to 55.00
RR. steel wheels	71.00 to 72.00
RR. spring steel	71.00 to 72.00
Rails 18 in. and under	80.00 to 81.00
Cupola cast.	55.00 to 56.00
Heavy breakable cast.	58.00 to 59.00
Cast iron car wheels	64.00 to 65.00
Malleable	66.00 to 67.00
Unstripped motor blocks	44.00 to 45.00
No. 1 machinery cast.	60.00 to 61.00

Cleveland

No. 1 hvy. melting	$61.00 to $62.00
No. 2 hvy. melting	53.00 to 54.00
No. 1 dealer bundles	61.00 to 62.00
No. 1 factory bundles	66.00 to 67.00
No. 2 bundles	44.00 to 45.00
No. 1 busheling	61.00 to 62.00
Machine shop turn.	35.00 to 36.00
Mixed bor. and turn.	38.00 to 39.00
Shoveling turnings	38.00 to 39.00
Cast iron borings	38.00 to 39.00
Cut struct'r'l & plates, 2 ft. & under	66.00 to 67.00
Drop forge flashings	61.00 to 62.00
Low phos. punch'gs, plate	62.00 to 63.00
Foundry steel, 2 ft & under	58.00 to 59.00
No. 1 RR. heavy melting	65.00 to 66.00
Rails 2 ft and under	78.00 to 79.00
Rails 18 in. and under	79.00 to 80.00
Railroad grade bars	45.00 to 46.00
Steel axle turnings	43.00 to 44.00
Railroad cast.	60.00 to 61.00
No. 1 machinery cast.	58.00 to 59.00
Stove plate	51.00 to 52.00
Malleable	66.00 to 67.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	$64.00 to $65.00
No. 2 hvy. melting	56.00 to 57.00
No. 1 dealer bundles	64.00 to 65.00
No. 2 bundles	47.00 to 48.00
Machine shop turn.	35.00 to 36.00
Shoveling turnings	41.00 to 42.00
Cast iron borings	40.00 to 41.00
Low phos. plate	65.00 to 66.00

Buffalo

No. 1 hvy. melting	$60.00 to $61.00
No. 2 hvy. melting	50.00 to 51.00
No. 1 busheling	60.00 to 61.00
No. 1 dealer bundles	60.00 to 61.00
No. 2 bundles	45.00 to 46.00
Machine shop turn.	34.00 to 35.00
Mixed bor. and turn.	38.00 to 39.00
Shoveling turnings	37.00 to 38.00
Cast iron borings	35.00 to 36.00
Low phos. plate	65.00 to 66.00
Scrap rails, random lgth.	63.00 to 64.00
Rails 2 ft and under	79.00 to 80.00
RR. steel wheels	65.00 to 66.00
RR. spring steel	60.00 to 61.00
RR. couplers and knuckles	74.00 to 75.00
No. 1 machinery cast.	54.00 to 55.00
No. 1 cupola cast.	48.00 to 49.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$51.00 to $52.00
No. 2 hvy. melting	44.00 to 45.00
No. 1 dealer bundles	51.00 to 52.00
No. 2 bundles	39.00 to 40.00
New busheling	51.00 to 52.00
Drop forge flashings	50.50 to 51.50
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	32.00 to 33.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	32.00 to 33.00
Low phos. punch'gs, plate	51.00 to 52.00
No. 1 cupola cast.	51.00 to 52.00
Heavy breakable cast.	44.00 to 45.00
Stove plate	45.00 to 46.00
Automotive cast.	54.00 to 55.00

St. Louis

No. 1 hvy. melting	$55.00 to $56.00
No. 2 hvy. melting	48.50 to 49.50
No. 1 dealer bundles	55.00 to 56.00
No. 2 bundles	42.50 to 43.50
Machine shop turn.	37.00 to 38.00
Cast iron borings	39.00 to 40.00
Shoveling turnings	39.00 to 40.00
No. 1 RR. hvy. melting	61.50 to 62.50
Rails, random lengths	73.00 to 74.00
Rails 18 in. and under	82.00 to 83.00
Locomotive tires uncut	65.50 to 66.50
Angles and splice bars	69.00 to 70.00
Std. steel car axles	83.00 to 84.00
RR. specialties	66.00 to 68.00
Cupola cast.	49.00 to 50.00
Heavy breakable cast.	42.50 to 43.50
Cast iron brake shoes	52.00 to 53.00
Stove plate	42.00 to 43.00
Cast iron car wheels	54.00 to 55.00
Rerolling rails	82.00 to 83.00
Unstripped motor blocks	42.50 to 43.50

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$50.50 to $51.50
No. 2 hvy. melting	39.50 to 40.50
No. 1 dealer bundles	50.50 to 51.50
No. 2 bundles	39.50 to 40.50
No. 1 busheling	50.50 to 51.50
Elec. furnace, 3 ft & under	54.50 to 55.50
Machine shop turn.	32.50 to 33.50
Mixed bor. and short turn.	33.50 to 34.50
Shoveling turnings	37.00 to 38.00
Clean cast chem. borings	38.00 to 39.00
No. 1 machinery cast.	47.00 to 48.00
Mixed cupola cast.	42.50 to 43.50
Heavy breakable cast.	46.00 to 47.00
Stove plate	41.00 to 42.00
Unstripped motor blocks	33.00 to 34.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$53.00 to 54.00
No. 2 hvy. melting	45.00 to 46.00
No. 2 dealer bundles	42.00 to 43.00
Machine shop turn.	34.00 to 35.00
Mixed bor. and turn.	37.00 to 38.00
Shoveling turnings	38.00 to 39.00
Clean cast chem. borings	33.00 to 34.00
No. 1 machinery cast.	51.00 to 52.00
Mixed yard cast.	48.00 to 49.00
Charging box cast.	48.00 to 49.00
Heavy breakable cast.	49.00 to 50.00
Unstripped motor blocks	39.00 to 40.00

Birmingham

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	44.00 to 45.00
No. 1 dealer bundles	46.00 to 47.00
No. 2 bundles	38.00 to 39.00
No. 1 busheling	46.00 to 47.00
Machine shop turn.	37.00 to 38.00
Shoveling turnings	38.00 to 39.00
Cast iron borings	27.00 to 28.00
Electric furnace bundles	54.00 to 55.00
Bar crops and plate	62.00 to 63.00
Structural and plate, 2 ft	60.00 to 61.00
No. 1 RR. hvy. melting	61.00 to 62.00
Scrap rails, random lgth.	68.00 to 69.00
Rails, 18 in. and under	74.00 to 75.00
Angles & splice bars	66.00 to 67.00
Rerolling rails	78.00 to 79.00
No. 1 cupola cast.	52.00 to 53.00
Stove plate	51.00 to 52.00
Charging box cast.	40.00 to 41.00
Cast iron car wheels	45.00 to 46.00
Unstripped motor blocks	44.00 to 45.00
Mashed tin cans	15.00 to 16.00
Elec. furnace, 2 ft & under	54.00 to 55.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$59.00 to $60.00
No. 2 hvy. melting	49.00 to 50.00
No. 1 dealer bundles	59.00 to 60.00
No. 2 bundles	43.00 to 44.00
Machine shop turn.	40.00 to 41.00
Mixed bor. and turn.	37.50 to 38.50
Shoveling turnings	42.00 to 43.00
Cast iron borings	37.50 to 38.50
Low phos. 18 in. & under	66.00 to 67.00
Rails, random lengths	71.00 to 72.00
Rails, 18 in. and under	79.00 to 80.00
No. 1 cupola cast.	48.00 to 49.00
Hvy. breakable cast.	47.00 to 48.00
Drop broken cast.	57.00 to 58.00

San Francisco

No. 1 hvy. melting	$59.00
No. 2 hvy. melting	57.00
No. 1 dealer bundles	58.00
No. 2 bundles	44.00
Machine shop turn.	$37.00 to 38.00
Cast iron borings	38.00
No. 1 RR. hvy. melting	59.00
No. 1 cupola cast.	60.00

Los Angeles

No. 1 hvy. melting	$59.00
No. 2 hvy. melting	57.00
No. 1 dealer bundles	58.00
No. 2 bundles	40.00
Machine shop turn.	38.00
Shoveling turnings	40.00
Cast iron borings	37.00
Elec. furn. 1 ft. and under (foundry)	70.00
No. 1 RR. hvy. melting	59.00
No. 1 cupola cast.	60.00

Seattle

No. 1 hvy. melting	$59.00
No. 2 hvy. melting	54.00
No. 2 bundles	$33.00 to 35.00
No. 1 cupola cast.	55.00
Mixed yard cast.	55.00

Hamilton, Ont.

No. 1 hvy. melting	$54.00
No. 2 hvy. melting	47.00
No. 1 dealer bundles	54.00
No. 2 bundles	40.50
Mixed steel scrap	46.00
Bushelings	39.50
Bush., new fact., prep'd.	52.00
Bush., new fact., unprep'd.	48.00
Machine shop turn.	31.00
Short steel turn.	35.00
Mixed bor. and turn.	28.00
Rails, rerolling	60.00
Cast scrap	50.00

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Ohio Magnets cost less to maintain because they're built with an extra margin of safety. So for extra magnet life, extra magnet value – always specify Ohio Magnets and Ohio Magnet Controllers. There's a type and size for every lifting job. Send for free copy of Bulletin 112, or consult the Yellow Pages for Ohio offices in principal cities. AA-1478

THE OHIO ELECTRIC MFG. CO.
5400 DUNHAM ROAD • MAPLE HEIGHTS
CLEVELAND, OHIO

Ohio Also Makes Separation Magnets • Nail Making Machines • Fractional Horsepower, Shell and Torque Motors

Important Copper From Africa

Outlook is for increased shipments of African copper to U. S. markets . . . Tonnages are small part of total domestic supply . . . Important to non-integrated consumer.

◆ MORE AFRICAN copper will be coming to the U. S. in both the near and distant future. This is the opinion of a representative of a company close to a number of African producers.

African copper constitutes only a small portion of the copper produced and peddled on the U. S. markets. But it is not insignificant to the non-integrated copper consumer. And it will assume a greater importance if more is made available for U. S. consumption.

The reason: statistics of copper produced in the U. S. and our chief foreign source, Chile, are not indicative of the amount available on the open market.

While U. S. production totaled 1,134,900 tons of primary copper in the U. S. in 1956, less than 700,000 tons were available to the non-integrated consumer. The remainder was either utilized by subsidiaries of producers or sold under private agreements.

Chilean production last year was up to 440,000 tons. But only about half of this found its way to this country and a percentage went to mills of Anaconda and Kennecott subsidiaries. About 106,000 tons were actually sold to outside companies.

Secondary production in the U. S. totaled about 138,597 tons.

Reducing production figures to metal available to non-integrated U. S. consumers puts African copper in a more proper prospective. African copper, when it reaches the U. S., is available to any user.

In 1956 African producers turned out about 396,000 long tons of copper. About 76,000 tons were shipped to the U. S. Current expansion plans among African producers would boost output to about 542,600 long tons by 1960.

A big part of this expansion is the construction of a huge dam across the Kariba Gorge on the Zambesi River in Southern Rhodesia. It will have a water capacity more than four times that of Hoover Dam, currently the world's largest artificial lake. All of this power will make possible additional refinery capacity. The reduced cost of shipping finished copper instead of matte or blister will help make the longer trip to the U. S. more economical.

It is very possible that by 1960 almost as much African copper will be available to U. S. non-integrated consumers, as Chilean —about 100,000 tons.

At present there is no duty for foreign copper entering the U. S. unless domestic copper price drops below 24¢ per lb.

Another advantage of African copper to U. S. consumers is the tendency it has to hold down the price of other metal sold in U. S.

Earlier in 1956, the management of Mufulira Copper Mines Ltd., one of the larger producers, said that it cost the company about 18 1/8¢ to produce one lb of electrolytic copper refined outside of Northern Rhodesia, including delivery to the customer.

Roan Antelope Copper Mines Ltd., a similar size installation, pegged its cost for one lb of electrolytic copper refined abroad and delivered at 19¼¢. A big reason for this economy is the fact that much African ore is 3 to 6 pct metal. U. S. ores average less than 1 pct copper.

Even reappraising these costs upward in the light of higher operating costs and expansion puts the floor in the vicinity of 23¢ at most.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum ingot	27.10	25.90	8/10/56
Aluminum pig	25.00	24.00	8/10/56
Copper (E)	38.00	40.00	10/26/56
Copper (CS)	34.825	35.00	1/4/57
Copper (L)	38.00	40.00	10/27/56
Lead, St. L.	16.80	16.30	1/13/56
Lead, N. Y.	16.00	16.50	1/13/56
Magnesium ingot	36.00	34.50	8/13/56
Magnesium pig	38.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	250-275	270-300	12/4/56
Zinc, E. St. L.	13.50	13.00	1/8/56
Zinc, N. Y.	14.00	13.50	1/8/56

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig, Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see column at right, other primary prices, pg. 116.

ALUMINUM . . . Aluminum Co. of America is launching a five-pronged offensive to boost the tonnage of its metal sold to the building products field. The objective—residential products.

Initial move will be the setting up of a residential building products sales division.

Alcoa will also seek to spur sales by sponsoring construction of about 50 model homes throughout the country in 1957. They will be known as Alcoa Care-Free Houses, and fully utilize aluminum building products.

A residential building products advisory committee will be formed of architects and designers to develop new methods and products.

A home design conference will be held in April with Pietro Belluschi, dean of architecture at Massachusetts Institute of Technology, as chairman.

Alcoa believes that reasonable use of aluminum building products now available would result in 1200 to 2000 lbs of aluminum in each new home. Emphasis is being placed on load bearing walls, roofing systems, partitioning, ceilings, wiring and home insulation.

SILVER . . . Continued increase in demand for silver for industrial applications resulted in over 50 pct of the 100 million oz consumed domestically in 1956 being used by industry, reports Handy & Harman, world's largest commercial mill.

Largest increases were registered by the electrical and electronics industry for a wide variety of forms and alloys, and in brazing alloys.

NICKEL . . . Free world production of nickel in 1956 was 450 million lbs, a new all-time high, according to Dr. John F. Thompson, chairman of the board, International Nickel Co. of Canada. This topped the previous record of 427 million lb turned out in 1955.

Deliveries by the various producers, estimated by the Inco chairman were (in millions of lb):

International Nickel Co.	285
Falconbridge Nickel Mines	43
Sherritt Gordon Mines	19
U.S. Gov't-Nicaro, Cuba	31
Hanna Nickel Smelting	14
S. A. Le Nickel (French)	22
Other sources	26

Distribution of nickel followed traditional lines—65 pct to the U. S. and 35 Pct to United Kingdom and other free world countries.

Dr. Thompson also points out that there are actually four prices of nickel in the U. S. Inco's and most producer's metal is pegged at 74¢ per lb. Nickel diverted to industry from the U. S. stockpile costs consumers 98¢ per lb if it was of Canadian origin, and $1.17 per lb if of U. S. origin. Over 79 million lbs were so diverted in 1956. Small amounts of nickel originating chiefly in Japan were priced at from $2 to $2.50 per lb.

By 1960 Dr. Thompson expects free world output of nickel to be from 600 to 625 million lbs.

Tin prices for the week: Jan. 9—100.50; Jan. 10—101.25; Jan. 11—101.125; Jan. 14—101.25; Jan. 15—101.00.*

*Estimate

"I answered all the questions yes, except the one at the door."

TRADE-MARKS WHICH IDENTIFY THE ORIGINAL AND THE BEST

"PHOSPHOR BRONZE."®

Phosphor Bronze ®

ELEPHANT BRAND®

A little more than seventy-five years ago a wonderful new kind of copper and tin alloy possessing high tensile strength, great resiliency and unusual corrosion-resistant properties was introduced to American industry. This new bronze alloy had been perfected by the addition of a small amount of phosphorus to the copper and tin mixture.

No other producer of metals in the United States was able to duplicate this extraordinarily useful alloy. Therefore, because of the uniqueness of this new phosphorus-bearing *alloy*, the smelters responsible for its creation gave it a trade name "PHOSPHOR BRONZE" and adopted for itself the firm name of The Phosphor Bronze Smelting Company.

This was the first Phosphor Bronze ever produced in the United States of America.

"Phosphor Bronze" was immediately accepted by America's burgeoning industry. Demand for the new alloy grew by leaps and bounds and The Phosphor Bronze Smelting Company soon had many imitations of its products. So, to protect customers from spurious imitations, the trade name of "Phosphor Bronze" was incorporated into two distinctive *trade-marks* which were duly registered in the U. S. Patent Office on February 21, 1888. These trade-mark registrations have been maintained, in full force, throughout the intervening years and are presently owned by The Phosphor Bronze Corporation, successors to the original Phosphor Bronze Smelting Company.

In time, new variations of the original "Phosphor Bronze" alloy were introduced by the now-famous smelting Company. To identify these, the trade name of "ELEPHANT BRAND" was adopted, together with a distinctive picture of an elephant. The words "ELEPHANT BRAND" were incorporated into a *trade-mark* and registered with the U. S. Patent Office on August 20, 1907. The picture of the elephant shown in this advertisement, is a new one, designed to supersede its 1906 predecessor and was Registered, as a *trade-mark*, on October 2, 1956.

We are proud that American industry has wholeheartedly accepted our product. The name "PHOSPHOR BRONZE" has become internationally known and is familiar to metalworking men and metallurgists everywhere.

In view of this unanimous acceptance and usage, we—the officers, stockholders and employees of The Phosphor Bronze Corporation acknowledge the universal use of the name and herewith bequeath it to the American metalworking industries. We reserve only . . . the exclusive right to use the trade-marks illustrated above.

THE PHOSPHOR BRONZE CORPORATION

A Wholly Owned and Operated Subsidiary of The Seymour Manufacturing Company

SEYMOUR, CONNECTICUT

Nonferrous Prices *(Effective Jan. 15, 1957)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136–.249	.250–3.
1100, 1100, 3003	44.3	42.1	40.9	40.2
5052	51.8	46.8	45.1	42.9
6061-0	48.9	44.6	42.8	42.6

Extruded Solid Shapes

Factor	6063,T-5	6062 T-6
6– 8	45.5–47.3	61.3–65.1
12–14	46.2–47.7	62.2–66.8
24–26	49.4–49.5	73.1–77.8
36–38	58.3–59.9	97.4–101.6

Screw Machine Stock—2011-T-3

Size*	¾	⅞–⅜	⅞–1	1⅛–1⅜
Price	59.7	58.8	57.4	55.2

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.352	$1.803	$2.254	$2.704
.024 gage	1.686	2.252	2.815	3.378

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type→ Gage→	.250–3.00	.250–2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.8	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.8	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	113	97	118
Strip, CR	111	99	128
Rod, bar, HR	94	80	99
Angles, HR	94	80	99
Plates, HR	107	96	111
Seamless tube	144	130	190
Shot, blocks	...	78	...

COPPER, BRASS, BRONZE

(Freight included on 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	58.13	.....	55.36	58.32
Brass, 70/30	50.19	50.73	50.13	53.10
Brass, Low	53.40	53.94	53.34	56.21
Brass, R L	54.54	55.08	54.48	57.35
Brass, Naval	54.14	.....	48.45	57.55
Munts Metal	52.19	.....	48.00	.....
Comm. Bs.	56.23	56.77	56.17	58.75
Mang. Bs.	57.88	.....	51.98	.....
Phos. Bs. 5%	77.25	.....	77.25	.....

TITANIUM

(10,000 *lb base, f.o.b. mill*)

Sheet and strip, commercially pure, $11.00-$12.10; alloy, $14.75; Plate, HR, commercially pure, $9.25-$9.75; alloy, $11.25. Wire, rolled and/or drawn, commercially pure, $8.50-$9.00; alloy, $11.00; Bar, HR or forged, commercially pure, $7.10-$7.35; alloy, $7.10-$7.30; billets, HR, commercially pure, $6.85-$7.10; alloy, $6.85-$7.05.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Antimony, American, Laredo, Tex. . 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb cont'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9%, small lots ..... $ 4.55
Chromium, 99.8% metallic basis . $ 1.31
Cobalt, 97-99% (per lb) ... $2.35 to $2.42
Germanium, per gm, f.o.b. Miami Okla., refined ..... $48.50-$53.50
Gold, U. S. Treas., per troy oz. ... $35.00
Indium, 99.9% dollars per troy oz. $ 2.25
Iridium, dollars per troy oz. $90 to $100
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb .. 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $255 to $257
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz. $23 to $24
Platinum, dollars per troy oz. $103 to $105
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) .. 91.375
Thorium, per kg $43.00
Uranium, normal per kg $40.00
Vanadium ..... $ 3.45
Zirconium sponge $10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 35.00
- No. 120 ..... 33.75
- No. 123 ..... 32.25

80-10-10 ingot
- No. 305 ..... 38.50
- No. 315 ..... 36.75

88-10-2 ingot
- No. 210 ..... 48.75
- No. 215 ..... 44.50
- No. 245 ..... 40.00

Yellow ingot
- No. 405 ..... 27.50

Manganese bronze
- No. 421 ..... 30.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 25.25-26.25
- 0.60 copper max. 25.00-26.00

Piston alloys (No. 122 type) ..24.50-25.50
No. 12 alum. (No. 2 grade) 23.00-24.00
108 alloy 23.00-24.00
195 alloy 25.00-26.25
13 alloy (0.60 copper max.) ... 25.25-26.25
AXS-679 ..... 23.00-24.00

Steel deoxidizing aluminum, notch bar granulated or shot
- Grade 1—95-97½% 23.75-24.50
- Grade 2—92-95% 22.75-23.50
- Grade 3—90-92% 21.75-22.50
- Grade 4—85-90% 20.75-21.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	32	31¼
Yellow brass	24⅝	22⅝
Red brass	28½	27¾
Comm. bronze	29½	28¾
Mang. bronze	23½	22¼
Yellow brass rod ends	24⅝	....

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 29¾
- No. 2 copper wire 28¼
- Light copper 26
- *Refinery brass 26¾

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 29¾
- No. 2 copper wire 28¼
- Light copper 26
- No. 1 composition 27½
- No. 1 comp. turnings 27
- Hvy. yellow brass solids 20
- Brass pipe 20
- Radiators 22

Aluminum

- Mixed old cast. ..... 15½—16½
- Mixed new clips ..... 16½—17½
- Mixed turnings, dry ..... 15½—16½

Dealer's Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

- No. 1 copper wire ..... 26½—27
- No. 2 copper wire ..... 25 —25½
- Light copper ..... 23½—24
- Auto radiators (unsweated) . 17½—18
- No. 1 composition ..... 24 —24½
- No. 1 composition turnings 22½—23
- Cocks and faucets ..... 18½—19
- Clean heavy yellow brass ... 16 —16½
- Brass pipe ..... 19 —19½
- New soft brass clippings .... 21 —21½
- No. 1 brass rod turnings .... 18 —18½

Aluminum

- Alum. pistons and struts .... 6 — 6½
- Aluminum crankcases .... 11½—12
- 1100 (2S) aluminum clippings 15 —15½
- Old sheet and utensils ..... 11½—12
- Borings and turnings ..... 7½— 8
- Industrial castings ..... 11½—12
- 2024 (24S) clippings ..... 13 —13½

Zinc

- New zinc clippings ..... 7 — 7½
- Old zinc ..... 4½— 5
- Zinc routings ..... 2¾— 3
- Old die cast scrap ..... 2½— 2¾

Nickel and Monel

- Pure nickle clippings ..... $1.75-$1.85
- Clean nickel turnings ..... $1.50-$1.60
- Nickel anodes ..... $1.75-$1.85
- Nickel rod ends ..... $1.75-$1.85
- New Monel clippings 75-80
- Clean Monel turnings 70-75
- Old sheet Monel 70-80
- Nickel silver clippings, mixed 21
- Nickel silver turnings, mixed 18

Lead

- Soft scrap lead ..... 12½—13
- Battery plates (dry) ..... 6¾— 7
- Batteries, acid free ..... 4 — 4¼

Miscellaneous

- Block tin ..... 77 —78
- No. 1 pewter ..... 61 —62
- Auto babbitt ..... 40 —41
- Mixed common babbitt ..... 13 —13½
- Solder joints ..... 18 —18½
- Siphon tops 42
- Small foundry type ..... 14¾—15
- Monotype ..... 14 —14½
- Lino. and stereotype ..... 13 —13½
- Electrotype ..... 12½—12¾
- Hand picked type shells ... 9½—10
- Lino. and stereo. dross ..... 4¾— 5
- Electro. dross ..... 4 — 4¼

IRON AGE

STEEL PRICES

(Effective Jan. 15, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$107.00 *B3*		5.05 *B3*	7.40 *B3*	5.05 *B3*						
	Buffalo, N. Y.	$74.00 *B3, R3*	$91.50 *B3, R3*	$107.00 *B3, R3*	5.90 *B3*	5.05 *B3*	7.40 *B3*	5.05 *B3*	4.675 *B3, R3*	6.85 *R7*	6.95 *B3*			
	Claymont, Del.													14.55 *C11*
	Harrison, N. J.													
	Conshohocken, Pa.		$96.50 *A2*	$114.00 *A2*					4.725 *A2*	6.90 *A2*	6.95 *A2*			
	New Bedford, Mass.									7.30 *R6*				
	Johnstown, Pa.	$74.00 *B3*	$91.50 *B3*	$107.00 *B3*		5.05 *B3*	7.40 *B3*							
	Boston, Mass.									7.40 *T8*				14.90 *T8*
	New Haven, Conn.									7.30 *D1*				
	Baltimore, Md.									6.85 *T8*				
	Phoenixville, Pa.					5.85 *P2*		5.85 *P2*						
	Sparrows Pt., Md.								4.675 *B3*		6.95 *B3*			
	Bridgeport, Wallingford, Conn.	$79.00 *N8*	$96.50 *N8*	$107.00 *N8*						7.30 *W1* 6.95 *N8*				
	Pawtucket, R. I. Worcester, Mass.									7.48 *A5,N7*				14.90 *N7*
MIDDLE WEST	Alton, Ill.								4.875 *L1*					
	Ashland, Ky.								4.675 *A7*					
	Canton-Massillon, Dover, Ohio		$94.00 *R3*	$107.00 *R3, T5*						6.85 *G4*		10.10 *G4*		14.55 *G4*
	Chicago, Ill. Franklin Park, Ill.	$74.00 *U1, R3*	$91.50 *U1, R3,W8*	$107.00 *U1, R3,W8*	5.90 *U1*	5.00 *U1, W8*	7.35 *U1, Y1* 6.00 *W8*	5.00 *U1*	4.675 *N4* 4.675 *A1*	6.95 *A1,T8*			7.75 *W8 S9*	14.55 *A1, S9,T8*
	Cleveland, Ohio									6.85 *A5,J3*			7.75 *J3*	
	Detroit, Mich.	$74.00 *R5*		$107.00 *R5*					4.775 *G3, M2*	6.95 *M2,G3, D2,P11*	7.05 *G3*	10.10 *G3, D2*	7.75 *G3*	
	Anderson, Ind.									6.85 *G4*		10.10 *G4*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$74.00 *U1*	$91.50 *U1*	$107.00 *U1, Y1*	5.90 *I3*	5.00 *U1*	7.35 *U1,I3*	5.25 *I3*	4.675 *U1, I3,Y1*	6.85 *Y1*	6.95 *U1, I3,Y1*	10.20 *Y1*	7.75 *U1, Y1*	
	Sterling, Ill.	$74.00 *N4*							4.775 *N4*					
	Indianapolis, Ind.									7.00 *C5*				
	Newport, Ky.												7.75 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$91.50 *S1, C10*	$107.00 *S1, C10*					4.675 *S1, R3*	6.85 *T4*	6.95 *S1, R3*	10.00 *S1, R3*	7.75 *S1*	14.55 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$74.00 *U1, J3*	$91.50 *U1, J3,C11*	$107.00 *U1, C11*	5.90 *U1*	5.00 *U1, J3*	7.35 *U1, J3*	5.00 *U1*	4.675 *P6*	5.750 *P6* 6.85 *J3,B4, S7*			7.75 *S9*	14.55 *S9*
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					5.00 *W3*			4.675 *W3*	6.85 *W3,F3*	6.95 *W3*	9.65 *W3*		
	Youngstown, Ohio	$74.00 *R3*	$91.50 *Y1, C10*	$107.00 *Y1*		5.00 *Y1*	7.35 *Y1*		4.675 *U1, Y1*	6.85 *Y1,C5*	6.95 *U1, Y1*	10.20 *Y1*	7.75 *U1, Y1*	
WEST	Fontana, Cal.	$83.50 *K1*	$101.00 *K1*	$128.00 *K1*		5.75 *K1*	8.10 *K1*	5.90 *K1*	5.525 *K1*	8.70 *K1*				
	Geneva, Utah	$91.50 *C7*				5.00 *C7*	7.35 *C7*							
	Kansas City, Mo.					5.10 *S2*	7.45 *S2*		4.925 *S2*		7.20 *S2*			
	Los Angeles, Torrance, Cal.		$101.00 *B2*	$127.00 *B2*		5.70 *C7, B2*	8.05 *B2*		5.425 *B2, C7*	8.80 *C1*			8.95 *B2*	
	Minnequa, Colo.					5.30 *C6*			5.775 *C6*					
	Portland, Ore.					5.75 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$101.00 *B2*			5.65 *B2*	8.00 *B2*		5.425 *C7,B2*					
	Seattle, Wash.		$105.00 *B2*			5.75 *B2*	8.10 *B2*		5.675 *B2*					
SOUTH	Atlanta, Ga.								4.875 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$74.00 *T2*	$91.50 *T2*			5.30 *T2,R3* 5.30 *C16*	7.35 *T2*		4.675 *T2,R3* 4.975 *C10*		6.95 *T2*			
	Houston, Lone Star, Texas	$80.00 *L3*	$96.50 *S2*	$112.00 *S2*		5.10 *S2*	7.45 *S2*		4.925 *S2*		7.20 *S2*			

IRON AGE

STEEL PRICES

(Effective Jan. 14, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	H Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.675 *B3*	5.75 *B3*				6.90 *B3*	8.525 *B3*			5.80 *W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price, Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.725 *A2*	5.80 *A2*				6.95 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.80 *B3*			
	Fairless, Pa.	4.725 *U1*	5.80 *U1*				6.95 *U1*	8.575 *U1*				$9.80 *U1*	$8.50 *U1*	
	New Haven Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.675 *B3*	5.75 *B3*	6.30 *B3*			6.90 *B3*	8.575 *B3*	9.275 *B3*		5.90 *B3*	$9.80 *B3*	$8.50 *B3*	
	Worcester, Mass.										6.10 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										6.00 *L1*			
	Ashland, Ky.	4.675 *A7*		6.30 *A7*	6.325 *A7*									
	Canton-Massillon, Dover, Ohio			6.30 *R3,R1*										
	Chicago, Joliet, Ill.	4.675 *W8, A1*					6.90 *U1*			5.80 *K2*	5.80 *A5,R3, N4,W8,K2*			
	Sterling, Ill.										5.90 *N4, K2*			
	Cleveland, Ohio	4.675 *J3, R3*	5.75 *J3, R3*		6.325 *R3*		6.90 *R3*	8.525 *R3, J3*			5.80 *A5*			
	Detroit, Mich.	4.775 *G3, M2*	5.85 *G3* 5.75 *M2*				7.00 *G2*	8.625 *G3*						
	Newport, Ky.	4.675 *A9*	5.75 *A9*											
	Gary, Ind. Harbor, Indiana	4.675 *U1, I3,Y1*	5.75 *U1, I3,Y1*	6.30 *U1, I3*	6.325 *U1, I3,Y1*	6.70 *U1*	6.90 *U1, Y1,I3*	8.525 *U1, Y1*			5.80 *Y1*	$9.70 *U1, Y1*	$8.40 *I3, U1,Y1*	7.15 *U1, Y1*
	Granite City, Ill.	4.875 *G2*	5.95 *G2*	6.50 *G2*	6.525 *G2*								$8.50 *G2*	7.25 *G2*
	Kokomo, Ind.			6.40 *C9*							5.90 *C9*			
	Mansfield, Ohio		5.75 *E2*			6.70 *E2*								
	Middletown, Ohio		5.75 *A7*	6.30 *A7*	6.325 *A7*	6.70 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.675 *S1, R3,N3*	5.75 *R3*	6.30 *R3*	6.325 *N3*	6.70 *N3*	6.90 *S1, R3*	8.525 *S1, R3*					$8.40 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.675 *U1, J3,P6*	5.75 *U1, J3,P6*	6.30 *U1, J3*	6.325 *U1*		6.90 *U1, J3,R3*	8.525 *U1, J3*	9.275 *U1*		5.80 *A5, P6,J3*	$9.70 *J3, U1*	$8.40 *U1*	7.15 *U1*
	Portsmouth, Ohio	4.675 *P7*	5.75 *P7*								5.80 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.675 *W3, W5*	5.75 *W3, W5,F3*	6.30 *W3, W5*		6.70 *W3, W5*	6.90 *W3*	8.525 *W3*				$9.70 *W5*	$8.40 *W5*	7.15 *W5* 7.40 *W3*
	Youngstown, Ohio	4.675 *U1, Y1*	5.75 *Y1*		6.325 *Y1*		6.90 *Y1*	8.525 *Y1*			5.80 *Y1*			7.15 *Y1*
WEST	Fontana, Cal.	5.525 *K1*	7.00 *K1*				7.75 *K1*	9.775 *K1*				$10.45 *K1*	$9.15 *K1*	
	Geneva, Utah	4.775 *C7*												
	Kansas City, Mo.										6.05 *S2*			
	Los Angeles, Torrance, Cal.										6.60 *B2*			
	Minnequa, Colo.										6.05 *C6*			
	San Francisco, Niles, Pittsburg, Cal	5.375 *C7*	6.70 *C7*	7.05 *C7*							6.45 *C7*	$10.45 *C7*	$9.15 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.675 *T2, R3*	5.75 *T2,*	6.30 *T2, R3*							5.80 *T2,R3*	$9.80 *T2*	$8.50 *T2*	
	Houston, Tex.										6.05 *S2*			

STEEL PRICES

(Effective Jan. 15, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.125 *B3*	8.325 *B3*	7.40 *B3*					
	Buffalo, N. Y.	5.075 *B3,R3*	5.075 *B3,R3*	6.90 *B5*	6.125 *B3,R3*	8.325 *B5,B3*	7.40 *B3*	4.85 *B3*				7.20 *W6*
	Claymont, Del.							5.70 *C4*		6.85 *C4*	7.55 *C4*	
	Coatesville, Pa.							5.25 *L4*		6.85 *L4*	7.55 *L4*	
	Conshohocken, Pa.							4.95 *A2*	5.925 *A2*	6.85 *A2*	7.25 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *P2*			
	Hartford, Conn.			7.35 *R3*		8.625 *R3*	7.40 *B3*					
	Johnstown, Pa.	5.075 *B3*	5.075 *B3*		6.125 *B3*			4.85 *B3*		6.85 *B3*	7.25 *B3*	7.20 *B3*
	Fairless, Pa.	5.225 *U1*	5.225 *U1*		6.275 *U1*							
	Newark, N. J.			7.30 *W10*		8.50 *W10*						
	Camden, N. J.			7.30 *P10*		8.50 *P10*						
	Bridgeport, Conn. Putnam, Conn.	5.30 *N8*	5.30 *N8*	7.20 *N8* 7.40 *W10*	6.20 *N8*	8.475 *N8*	7.50 *N8*					
	Sparrows Pt., Md.		5.075 *B3*					4.85 *B3*		6.85 *B3*	6.85 *B3*	7.30 *B3*
	Palmer, Worcester, Readville, Mass. Milton, Pa.	5.225 *M7*	5.225 *M7*	7.40 *B5,C14*		8.325 *A5* 8.625 *B5*						7.50 *A5,W6* 9.025 *T8*
	Spring City, Pa.			7.30 *K4*		8.50 *K4*						
MIDDLE WEST	Alton, Ill.	5.275 *L1*										7.40 *L1*
	Ashland, Newport, Ky							4.85 *A7,N5*		6.85 *N5*		
	Canton, Massillon, Ohio			6.85 *R3,R2*	6.125 *R3,T5*	8.325 *R3,R2, T5*						
	Chicago, Joliet, Ill.	5.075 *U1,R3, W8,N4* 5.575 *P13*	5.075 *U1,R3, N4* 5.575 *P13*	6.85 *A5,B5, W10,L2 W8,N9*	6.125 *U1,R3, W8*	8.325 *A5,B5, W8,L2,N9, W10*	5.875 *W8*	4.85 *U1,I3, W8,A1*	5.925 *U1*	6.85 *U1,W8*	7.25 *U1*	7.20 *A5,K2 R3,N4,W7*
	Cleveland, Ohio	5.075 *R3*	5.075 *R3*	6.85 *A5,C13*		8.325 *A5,C13*	7.425 *R3*	4.95 *J3,R3*	5.925 *J3*		7.25 *J3,R3*	7.20 *A5, C13*
	Detroit, Mich.	5.175 *G3*	5.425 *G3*	7.05 *B5,P8* 7.10 *P3* 6.85 *R5*	6.225 *G3* 6.125 *R5*	8.525 *B5,P3, P8* 8.325 *R5*	7.525 *G3*	4.95 *G3*		6.90 *G3*		
	Duluth, Minn.											7.20 *A5*
	Gary, Ind. Harbor, Crawfordsville	5.075 *U1,I3, Y1*	5.075 *U1,I3, Y1*	6.85 *R3,M5*	6.125 *U1,I3, Y1*	8.325 *R3,M4*	7.425 *U1,I3, Y1*	4.85 *U1,I3, Y1*	5.925 *I3*	6.85 *U1,Y1*	7.25 *U1,Y1*	7.30 *M4*
	Granite City, Ill.							5.05 *G2*				
	Kokomo, Ind.											7.30 *C9*
	Sterling, Ill.	5.525 *N4*	5.175 *N4*									7.30 *K2*
	Niles, Warren, Ohio Sharon, Pa.			6.85 *C10*	6.125 *C10,S1*	8.325 *C10*	7.425 *S1*	4.85 *S1,R3*		6.85 *S1*	7.25 *S1,R3*	
	Pittsburgh, Pa. Midland, Pa.	5.075 *U1, C11,J3*	5.075 *U1,J3*	6.85 *A5,C8, J3,R3,S9, B4,W10*	6.125 *U1,C11*	8.325 *A5,R3, S9,C8,W10, C11*	7.425 *U1,J3*	4.85 *U1,J3*	5.925 *U1*	6.85 *U1,J3*	7.25 *U1,J3*	7.20 *A5,J3, P6*
	Portsmouth, Ohio											7.20 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							4.85 *W5*				
	Youngstown, Ohio	5.075 *U1, Y1,R3*	5.075 *U1, Y1,R3*	6.85 *U1,Y1, F2*	6.125 *U1,Y1*	8.325 *Y1,F2*	7.425 *U1,Y1,*	4.85 *U1,Y1, R3*		6.85 *Y1*	7.25 *Y1*	7.20 *Y1*
WEST	Emeryville, Cal.	5.825 *J5*	5.825 *J5*									
	Fontana, Cal.	6.025 *K1*	6.025 *K1*		7.175 *K1*		8.125 *K1*	5.60 *K1*		7.60 *K1*	8.00 *K1*	
	Geneva, Utah	5.175 *C7*						4.85 *C7*			7.25 *C7*	
	Kansas City, Mo.	5.325 *S2*	5.325 *S2*		6.375 *S2*		7.675 *S2*					7.45 *S2*
	Los Angeles, Torrance, Cal.	5.775 *C7,B2*	5.775 *C7,B2*	8.30 *R3,P14*	7.175 *B2*	10.10 *P14*	8.125 *B2*					8.15 *B2*
	Minnequa, Colo.	5.525 *C6*	5.525 *C6*					5.70 *C6*				7.45 *C6*
	Portland, Ore.	5.825 *O2*	5.825 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.775 *C7,P9* 5.825 *B2*	5.775 *C7,P9* 5.825 *B2*				8.175 *B2*					8.15 *C7,C6*
	Seattle, Wash.	5.825 *B2 N6*	5.825 *B2*				8.175 *B2*	5.75 *B2*		7.75 *B2*	8.15 *B2*	
SOUTH	Atlanta, Ga.	5.575 *A8*										7.40 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.075 *T2,R3* 5.375 *C16*	5.075 *T2,R3* 5.375 *C16*				7.425 *T2*	4.85 *T2,R3*			7.25 *T2*	7.20 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.325 *S2*	5.325 *S2*		6.375 *S2*		7.675 *S2*	4.95 *S2* 5.20 *L3*		6.95 *S2*	7.35 *S2*	7.45 *S2*

† Merchant Quality—Specialty Quality .35¢ higher.

Steel Prices *(Effective Jan. 15, 1957)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metals Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
D5 Henry Disston Div., Philadelphia

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Ca.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A. Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Stee Co., Rome, N. Y

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wycoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk	Gal.	Blk.	Ga.	Blk.	Ga.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt *B3*	10.50	+4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75								
Youngstown *R3*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75								
Fontana *K1*	+0.50	+15.75	2.50	+11.75	5.00	+8.25	7.50	+7.50	8.00	+6.50	8.50	+6.00	10.00	+6.25								
Pittsburgh *J3*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
Alton, Ill. *L1*	10.50	+4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75								
Sharon *M3*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75								
Fairless *N2*	10.50	+4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75								
Pittsburgh *N1*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
Wheeling *W5*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75								
Wheatland *W4*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75								
Youngstown *Y1*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
Indiana Harbor *Y1*	11.50	+5.75	14.50	1.25	17.00	3.75	19.50	4.50	20.00	5.50	20.50	6.00	22.00	5.75								
Lorain *N2*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75								
Youngstown *R3*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75								
Fairless *N2*	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75								
Fontana *K1*	4.00		8.00		10.00		10.50		11.00		11.50		12.00									
Pittsburgh *J3*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25
Alton, Ill. *L1*	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75								
Sharon *M3*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75								
Pittsburgh *N1*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	8.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25
Wheeling *W5*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	8.75								
Wheatland *W4*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	8.75								
Youngstown *Y1*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	8.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25
Indiana Harbor *Y1*	16.00	2.25	20.00	6.25	22.00	9.75	22.50	8.50	23.00	9.50	23.50	10.00	22.00	8.75								
Lorain *N2*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.68	T-1
18	4	1	—	5	2.385	T-4
18	4	2	—	—	1.845	T-2
1.5	4	1.5	8	—	1.04	M-1
6	4	3	6	—	1.43	M-3
6	4	2	5	—	1.185	M-2

High-carbon chromium	.83 D-3, D-5
Oil hardened manganese	.45 O-2
Special carbon	.41 W-1
Extra carbon	.345 W-1
Regular carbon	.29 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	33.25
	304	34.60	38.00	41.50	35.25
	316	39.70	43.20	46.65	52.25
	321	36.35	39.80	43.50	42.00
	347	39.50	43.95	48.45	51.00
	405	29.20	33.15	37.05	.....
	410, 430	28.70	32.65	36.55	.....

CR Strip (89) Copper, 10 pct, 2 sides, 40.65; 1 side, 33.40.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	9.00	9.20	.....
Armature	10.35	10.35	10.85
Elect.	11.00	11.025	11.525
Motor	12.05	12.075	12.575
Dynamo	13.05	13.05	13.55
Trans. 72	14.05	14.05	14.55
Trans. 65	14.60	Grain Oriented	
Trans. 58	15.10	Trans. 80	18.50
Trans. 52	16.15	Trans. 73	19.00

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*) Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*) (20¢ higher, HR); Zanesville, Butler (*A7*).

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1956 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.10
Old range, bessemer	11.25
Old range, nonbessemer	11.10
Mesabi, bessemer	11.00
Mesabi, nonbessemer	10.85
High phosphorus	10.85

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	167	181	195	187	8.10	8.50
Aliquippa, Pa. *J3****	164	179	...	181	7.95	8.475
Atlanta *A8***	166	182	192	190	8.05	8.65
Bartonville *K2***	166	182	192	190	8.05	8.65
Buffalo *W6*	.....	.....	.....	.....	8.10	8.50
Chicago, Ill. *N4***	164	180	167	190	188	7.95	8.55
Cleveland *A6*	173	.....	.....	.....	8.10	.....
Cleveland *A5*	.....	.....	.....	.....	7.95	.....
Crawfordsville *M4***	166	182	192	190	8.05	8.65
Donora, Pa. *A5*	164	176	190	184	7.95	8.35
Duluth *A5*	164	176	190	184	7.95	8.35
Fairfield, Ala. *T2*	164	176	190	184	7.95	8.35
Galveston *D4*	169‡	.....	.....	.....	.....	.....
Houston *S2*	169	181	195	189	8.20	8.60
Johnstown, Pa. *B3***	164	180	167	188	7.95	8.55
Joliet, Ill. *A5*	164	176	190	184	7.95	8.35
Kokomo, Ind. *C9**	166	178	192	186	8.05	8.45
Los Angeles *B2***	.....	.....	.....	.....	8.90	9.50
Kansas City *S2**	169	181	195	189	8.20	8.60
Minnequa *C6*†	169	181	172	195	189	8.20	8.60
Monessen *P6*	167	185	.....	.....	191	8.10	8.10
Pittsburg, Cal. *C7*	186	199	.....	.....	204	8.90	9.30
Portsmouth *P7*	.....	.....	.....	.....	7.95	.....
Rankin, Pa. *A5*	164	176	.....	.....	184	7.95	8.35
So. Chicago *R3*	167	181	.....	195	187	8.10	8.50
S. San Francisco *C6*	.....	.....	.....	214	.....	8.90	9.30
Sparrows Pt. *B3***	166	.....	.....	192	190	8.05	8.65
Struthers, O. *Y1**	.....	.....	.....	.....	.....	7.95	8.45
Worcester *A5*	170	.....	.....	.....	.....	8.25	8.65
Williamsport, Pa. *S5*	.....	.....	175	.....	.....	.....	.....

* Zinc less than .10¢. † Plus zinc extras.
** 13.5 zinc. ‡ Wholesalers only.
*** .10¢ zinc.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. *T8*	8.25	10.10	12.30	15.30	18.25
Bristol, Conn. *W12*	.....	.....	12.30	15.30	18.25
Boston *T8*	8.50	10.10	12.30	15.30	18.25
Buffalo, N. Y. *R7*	7.95	9.80	12.60	15.00	17.95
Carnegie, Pa. *S9*	‡	9.80	12.00	15.00	.....
Cleveland *A5*	7.95	9.80	12.00	15.00	17.95
Detroit *D1*	8.05	9.90	12.10	15.10	.....
Detroit *D2*	8.05	9.90	12.10	.....	.....
Dover, O. *G4*	7.95	9.80	12.00	15.00	17.95
Franklin Park, Ill. *T8*	8.05	9.80	12.60	15.00	17.95
Harrison, N. J. *C11*	.....	.....	12.30	15.30	18.25
Indianapolis *C5*	8.10	9.95	12.60	15.00	17.95
New Castle, Pa. *B4*	7.95	9.80	12.60	15.00	.....
New Haven, Conn. *D1*	8.40	10.10	12.30	15.30	.....
Pawtucket, R. I. *N7*	8.50	10.10	12.30	15.30	18.25
Pittsburgh *S7*	7.95	9.80	12.60	15.00	17.95
Riverdale, Ill. *A1*	8.05	9.80	12.00	15.00	17.95
Sharon, Pa. *S1*	7.95	9.80	12.60	15.00	17.95
Trenton *R4*	.....	10.10	12.90	15.30	18.25
Wallingford *W1*	8.40	10.10	12.30	15.30	18.15
Warren, Ohio *T4*	7.95	9.80	12.60	15.00	17.95
Weirton, W. Va. *W3*	7.95	9.80	12.60	15.00	17.95
Worcester, Mass. *A5*	8.50	10.10	12.30	15.30	18.25
Youngstown *C5*	7.95	9.80	12.60	15.00	17.95

‡ On Application.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	34.88	40.85	33.21	.....
	2½	12	46.98	55.01	44.73	.....
	3	12	54.24	63.53	51.66	.....
	3½	11	63.32	74.16	60.30	.....
	4	10	84.09	98.47	80.07	.....
National Tube	2	13	34.88	40.85	33.21	.....
	2½	12	46.98	55.01	33.73	.....
	3	12	54.24	63.53	51.66	.....
	3½	11	63.32	74.16	60.30	.....
	4	10	84.09	98.47	80.07	.....
Pittsburgh Steel	2	13	34.88	40.85	.....	.....
	2½	12	46.98	55.01	.....	.....
	3	12	54.24	63.53	.....	.....
	3½	11	63.32	74.16	.....	.....
	4	10	84.09	98.47	.....	.....

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery ‡ Charge	Sheets Hot-Rolled 10 ga. & hvr.	Sheets Cold-Rolled (15 gage)	Sheets Galvanized (10 gage)	Strip Hot-Rolled	Strip Cold-Rolled	Plates	Shapes Standard Structural	Bars Hot-Rolled	Bars Cold-Finished	Alloy Bars Hot-Rolled 4615 As rolled	Alloy Bars Hot-Rolled 4140 Annealed	Alloy Bars Cold-Drawn 4615 As rolled	Alloy Bars Cold-Drawn 4140 Annealed
Atlanta		8.07	9.27	9.83	8.16	.....	8.40	8.44	8.30	10.14	.....	.....	.....	.....
Baltimore	$.10	7.79	8.99	9.12	8.27	.....	8.12	8.57	8.34	9.09	14.99	14.44	18.39	18.09
Birmingham	.15	7.68	8.88	8.85	7.78	.....	8.01	8.05	7.91	10.04	.....	.....	.....	.....
Boston	.10	8.70-8.80	9.73-9.83	11.02	8.79-8.89	.....	8.98-9.08	8.90-9.00	8.88-8.98	10.71-10.81	15.05	14.45	18.51	18.10
Buffalo	.15	7.90	9.05	10.87	8.15	.....	8.40	8.40	8.15	8.85	15.00	14.45	18.40	.....
Chicago	.15	7.70-7.95	8.90-9.05	9.70	7.78-7.97	.....	8.01-8.31	8.05-8.35	7.91-8.06	8.35-8.50	14.65	14.10	18.05	17.75
Cincinnati	.15	7.97	9.04	9.90	8.21	.....	8.49	8.70	8.34	8.97	14.93	14.38	18.33	18.03
Cleveland	.15	7.68	8.88	9.60	7.88	.....	8.21	8.38	7.99	8.60	14.73	14.18	18.13	17.83
Denver		9.55	11.09	12.41	9.70	.....	9.80	9.60	9.75	10.54	.....	.....	.....	19.79
Detroit	.15	8.06	9.28	10.17	8.25	.....	8.48	8.70	8.33	8.83	.....	14.04	.....	17.09
Houston		8.70	9.65	.....	8.80	.....	8.60	8.90	8.95	10.55	15.50	.....	19.30	19.05
Kansas City	.20	8.52	9.72	10.07	8.60	.....	8.83	8.87	8.73	9.42	15.32	14.77	18.72	18.42
Los Angeles	.10	8.90	10.65	11.65	9.10	.....	9.35	8.95	8.80	11.70	15.85	15.35	19.70	19.45
Memphis	.15	8.02	9.22	.....	8.12	.....	8.35	8.39	8.25	9.85	.....	.....	.....	.....
Milwaukee	.15	8.08	9.02	9.82	8.10	.....	8.44	8.56	8.03	8.57	14.77	.....	18.17	17.87
New York	.10	8.45	9.63	10.33	8.91	.....	8.88	8.84	8.93	10.71	15.02	14.47	18.42	18.12
Norfolk	.20	8.00	.....	.....	8.40	.....	8.35	8.70	8.45	10.70	.....	.....	.....	.....
Philadelphia	.10	7.89-7.99	9.08-9.18	9.66-10.22	8.58-8.68	.....	8.28-8.38	8.38-8.48	8.37-8.47	9.12-9.22	14.80	14.15-14.25	18.20	17.90
Pittsburgh	.15	7.68	8.88	10.05	7.88	.....	8.01	8.20	7.91	8.60	14.65	13.80-14.10	18.05	16.85-17.75
Portland		8.90	9.65	11.40	9.05	.....	8.70	8.90	8.95	13.55	16.70	16.10	20.40	20.25
San Francisco	.10	8.75	10.30	10.80	8.95	.....	8.85	8.85	8.80	12.30	15.85	15.35	19.70	19.45
Seattle		9.35	10.45	11.55	9.50	.....	9.05	9.15	9.30	13.15	16.10	15.55	19.50	19.20
St. Louis	.15	8.02-8.29	9.21-9.49†	10.03-10.18	8.11-8.34	.....	8.34-8.67	8.48-8.82	8.25-8.40	8.93-9.08	14.83-14.98	14.28	18.23-18.38	17.93
St. Paul	.15	8.29	9.64	10.31	8.39	.....	8.71	8.75	8.52	9.21	.....	14.62	.....	18.27

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.
** F.O.B. Plant, warehouse price. † 16 gage. ‡ Deduct for country delivery.

(Effective Jan. 15, 1955)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.075	6.00	6.35	....	....	....	....
So. Chicago *R3*	....	....	....	8.775	....	....	....
Ensley *T2*	5.075	6.00	....	....	....	....	....
Fairfield *T2*	....	6.00	....	8.775	....	6.025	....
Gary *U1*	5.075	6.00	....	....	....	6.025	....
Ind. Harbor *I3*	5.075	....	6.35	8.775	....	6.025	....
Ind. Harbor *Y1*	....	....	....	8.775	....	....	....
Johnstown *B3*	....	6.00	....	....	....	....	....
Joliet *U1*	5.075	....	6.35	....	....	....	....
Kansas City *S2*	....	....	....	8.775	....	....	....
Lackawanna *B3*	5.075	6.00	6.35	....	....	6.025	....
Lebanon *B3*	....	....	....	....	....	....	13.10
Minnequa *C6*	5.075	6.50	6.35	8.775	....	6.025	13.10
Pittsburgh *P5*	....	....	....	8.775	12.85	....	....
Pittsburgh *J3*	....	....	....	8.775	....	....	13.10
Seattle *B2*	....	....	....	9.275	....	6.175	13.16
Steelton *B3*	5.075	....	6.35	....	....	6.025	13.10
Struthers *Y1*	....	....	....	8.775	....	....	....
Torrence *C7*	....	....	....	....	....	....	....
Williamsport *S5*	....	6.15	....	....	....	....	....
Youngstown *R3*	....	....	....	8.775	....	....	....

COKE

Furnace, beehive (f.o.b oven) Net-Ton
Connellsville, Pa. ... $15.25 to $15.75
Foundry, beehive (f.o.b. oven)
$18.00 to $19.00

Foundry oven coke

Buffalo, del'd	$30.75
Detroit, f.o.b.	29.50
New England, del'd	30.55
Seaboard, N. J., f.o.b.	28.75
Philadelphia, f.o.b.	28.50
Swedesland, Pa., f.o.b.	28.50
Painesville, Ohio, f.o.b.	29.50
Erie, Pa., f.o.b.	29.50
Cleveland, del'd	31.55
Cincinnati, del'd	28.59
St. Paul, f.o.b.	28.50
St. Louis, f.o.b.	30.50
Birmingham, f.o.b.	27.60
Milwaukee, f.o.b.	29.50
Lone Star, f.o.b.	25.50

ELECTRODES

Cents per lb f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	24.75	40	100, 110	10.70
20	72	24.00	35	110	10.70
16 to 18	72	24.50	30	110	10.85
14	72	25.00	24	72 to 84	11.25
12	72	25.50	20	90	11.00
10	60	26.50	17	72	11.40
10	48	27.00	14	72	11.85
7	60	26.75	12	60	12.95
6	60	30.00	10	60	13.00
4	40	33.25	8	60	13.30
3	40	35.25			
2½	30	37.25			
2	24	57.75			

*Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper
Cast elliptical, 18 in. or longer, 5000 lb lots ... 57.42
Electrodeposited ... 45.28
Brass, 80-20, ball anodes, 2000 lb or more ... 58.00
Zinc, ball anodes, 2000 lb lots ... 21.25
(for elliptical add 2¢ per lb)
Nickel, 99 pct plus, rolled carbon ... 90.50
(rolled depolarized add 3¢ per lb)
Cadmium ... $1.70
Tin, ball anodes and elliptical $1.10 to $1.16

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum ... 80.50
Copper sulphate, 5 or more 100 lb bags, per cwt. ... 20.65
Nickel salts, single, 100 lb bags ... 38.25
Nickel chloride, freight allowed, 300 lb ... 43.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums ... 21.55
(Philadelphia price 21.80)
Zinc cyanide, 100 to 900 lb ... 55.55
Potassium cyanide, 100 lb drum N. Y. ... 48.00
Chromic acid, flake type, 1 to 20 100 lb drums ... 29.25

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)
Pct Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	55	58½	60½	61½
⅝" thru 1" x longer than 6"	46½	50	52½	54
Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter	55	58½	60½	61½
Lag, all diam. x 6" & shorter	55	58	60	61
Lag, all diam. longer than 6 in.	47	50	52	53
Plow bolts, ½" and smaller x 6" and shorter	54	57½	59	60

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full Case or Keg Price
¾ in. or smaller	62
⅞ in. to 1 in. inclusive	59½
1⅛ in. to 1½ in. inclusive	64
1⅝ in. and larger	58

C.P. Hex regular & hvy.

¾ in. and smaller	63
⅞ in. to 1½ in. inclusive	59½
1⅝ in. and larger	58

Hot Galv. Nuts (All Types)

¾" and smaller ... 50

Semi-finished Hex Nuts

¾ in. and smaller	63
⅞ in. to 1½ in. inclusive	59½
1⅝ in. and larger	58

(Add 25 pct for broken case or keg quantities)

Finished

1" and smaller ... 65

Rivets

Base per 100 lb
½ in. and larger ... $10.85
Pct Off List
7/16 in. and smaller ... 26½

Cap Screws

	Discount (Packages) *Bright Treated*	*H. C. Heat*
New std. hex head, packaged		
¼" diam. and smaller x 6" and shorter	47	54
⅜", ½" and 1" diam. x 6" and shorter	31	13
⅝" diam. and smaller x longer than 6"	18½	+ 1
⅜", ½" and 1" diam. & longer than 6"	5½	+19½

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	47	63
⅝" through 1" dia. x 6" and shorter	31	51½

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 1/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish		Discount Mach. Screws	Stove Bolts
Cartons		19	32
Bulk	*Quantity*		
To ¼" diam. incl.	25,000-200,000	9	54
5/16 to ½" diam. incl.	15,000-100,000	9	54
All diam. over 3" long	5,000-100,000	—	54

Machine Screw & Stove Bolt Nuts

		Discount Hex	Square
In cartons		16	19
In Bulk	*Quantity*		
¼" diam. & smaller	15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	119.0
New York	131.4
Chicago	133.4
San Francisco-L. A.	140.2

Dec. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955 issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick *Carloads per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$128.00
No. 1 Ohio	128.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	20.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$140.00
Childs, Hays, Pa.	145.00
Chicago District	150.00
Western Utah	144.00-165.00
California	170.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	150.00-157.00
Silica cement, net ton, bulk, Latrobe	26.50
Silica cement, net ton, bulk, Chicago	24.00
Silica cement, net tons, bulk, Ensley, Ala.	25.50
Silica cement, net ton, bulk, Mt. Union	23.00
Silica cement, net ton, bulk, Utah and Calif.	35.00

Chrome Brick *Per net ton*

Standard chemically bonded, Balt.	$98.00
Standards chemically bonded, Curtiner, Calif.	108.00
Burned, Balt.	92.00

Magnesite Brick

Standard, Baltimore	$121.00
Chemically bonded, Baltimore	109.00

Grain Magnesite St. ⅝ to ⅛-in. grains

Domestic, f.o.b. Baltimore in bulk	$69.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.	
in bulk	43.00
in sacks	49.00

Dead Burned Dolomite *Per net ton*

F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$16.00
Midwest	16.35
Missouri Valley	15.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron f.o.b. Riverton, N. J., ocean bags	8.50¢
Canadian sponge iron, Del'd in East, carloads	9.5¢
Domestic sponge iron, 98+% Fe, carloads lots	8.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 5 to 10 micron, 98%, 99.8+% Fe	86.0¢ to $1.55
Aluminum freight allowed	38.00¢
Brass, 10 ton lots	37.50¢ to 50.00¢
Copper, electrolytic	49.75¢
Copper, reduced	49.75¢
Cadmium, 100-199 lb, 95¢ plus metal value	
Chromium, electrolytic 99.85% min. Fe .03 max. Del'd	$5.00
Lead	8.90¢ plus metal value
Manganese	70.0¢
Molybdenum, 99%	$3.60 to $3.95
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	99.0¢
Stainless steel, 316	$1.32
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$4.20
Zinc, 10 ton lots	18.75¢ to 32.50¢

Ferroalloy Prices

(Effective Jan. 15, 1957)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C	41.50	0.20% C	38.50
0.03% C	41.00	0.50% C	38.25
0.06% C	39.50	1.00% C	37.50
0.10% C	39.00	1.50% C	37.35
0.15% C	38.75	2.00% C	37.25

4.00-4.50% C, 67.70% Cr, 1-2% Si.. 27.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.75
0.025% C (Simplex) 34.75
0.10% C, 50-52% Cr, 2% max Si .. 35.75
8.50% max. C, 60-55% Cr, 3-6% Si.. 24.00
8.50% C, 50-55% Cr, 3% max Si.... 24.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.31
0.50% max. C	1.31
9 to 11% C, 33-91% Cr, 0.75% Fe..	1.40

Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

Carloads	44.65
Ton lots	48.95
Less ton lots	51.45

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.
30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	20.15
Less ton lots	21.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore	12.75
Johnstown, Pa.	12.75
Sheridan, Pa.	12.75
Philo, Ohio	12.75
S. Duquesne	12.75

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.
Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed	17.20

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	33.00
Ton lots	35.00
250 to 1999 lb	37.00
Premium for hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn... 25.50

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si....	28.60	31.40	32.60

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	13.80
Ton lots	15.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Ton lots, packed	17.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $100.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96.50% Si, 2% Fe	23.95	22.65
98% Si, 0.75% Fe	24.45	23.15

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Contract prices, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si	13.90	75% Si	16.80
65% Si	15.65	85% Si	18.50
	90% Si	19.90	

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Alsifer, 20% Al, 40% Si, 40% Fe. Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound Contained Mo. $1.28

Ferrocolumbium, 50-50%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	$6.90
Less ton lots	6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Sb plus Ta.... $4.95

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.50
Less ton lots $1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $215.00

Ferrotungsten, ¼ x down, packed, per pounds contained W, ton lots delivered $3.15

Molybdic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.33

Zirconium contract basis, per lb of alloy
35-40% f.o.b. freight allowed, carloads, packed ..... 27.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Bortam, f.o.b. Niagara Falls,

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots per pound..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.... 1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B.	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots $2.15

RAILWAY EQUIPMENT
FOR SALE
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RAILWAY CARS
All Types

SERVICE-TESTED
FREIGHT CAR REPAIR PARTS
For All Types of Cars

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Diesel, Steam, Gasoline, Diesel-Electric

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50-TON CAPACITY GONDOLA CARS
Length—46'0" Drop Ends
Steel Underframes Steel Ends
Steel Sides Wood Floor
AB Air Brakes
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6,000- 8,000- and 10,000-Gallon
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"ANYTHING containing IRON or STEEL"

THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Word From Congress . . . A tax bill designed to extend the benefits of rapid depreciation to purchasers of used industrial equipment has been introduced in the Senate by Senator John Sparkman.

In introducing the measure Sparkman, Chairman of the Senate Small Business Committee declared, "The 1954 Internal Revenue Code added a new provision to our tax law which enabled purchasers of new equipment to write off the cost of such equipment at accelerated rates. This, of course, means a tax saving to such businessmen. It is a well-recognized fact, however, that many small concerns cannot afford the present-day high costs of certain equipment which they need to run their businesses. They must buy used equipment at the prices they can afford to pay."

"I know of no good reason why the purchasers of such equipment should not be granted the same privilege of rapid depreciation now given to purchasers of new equipment. By virtue of the very fact that the equipment is used and possibly approaching obsolescence when purchased, it would appear to me to be only fair that the purchaser should be entitled to write off his cost over a relatively short period of time."

Idling At the Moment . . . Detroit dealers are blaming slack business on the fact that new model automotive programs have not as yet started to pick up steam.

Despite the current lull, it's felt that 1956 was one of the best peacetime years for the used machinery industry in that area. And the feeling is that 1957 is going to be almost as good or equally as good as 1956.

Looking Ahead . . . Here's why dealers feel that '57 will be one of the best years ever:

It's an open secret that minor facelifts in the auto industry are almost a thing of the past. More extensive changes on the 1958 models indicate great things for the demand for used machines from small job shops in the area. At least three cars, Lincoln, Pontiac and Chevrolet, are scheduled for major changes. This in itself is going to call for extensive tooling.

Add to this the fact that Ford Motor Co. will be introducing a brand new car in the medium price range next year and you come up with a pretty fertile field for machinery dealers to cultivate.

Long Distance Calling . . . Despite the present lull in business, there are still a great many inquiries coming into dealers' offices. Many of these are from outside the area and are concentrated mostly in the midwest in the states of Illinois, Indiana, Kentucky and Ohio. Some calls are still coming in from the West Coast and from as far away as Texas.

Prospective customers are all looking for late model machinery, particularly tool room equipment. One dealer believes that but for the shortage of late model equipment the present lull in business wouldn't be so bad.

Parts Are Problems . . . Those who do have a fair supply of newer machinery are finding it increasingly harder to obtain parts for an adequate rebuilding program.

Some dealers are at the point where they are making their own parts rather than waiting 2 to 3 months.

Despite some of the current drawbacks to business, most dealers are still confident that they can weather any storms that come up during the year. Most are convinced that business will remain good.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
6' x 3/16" Niagara Initial Type
8' x ½" Webb 129-V Vertical
10' x ⅜" Bertsch Initial Type
10' x ½" King Pyramid Type
12' x ¾" Southwark Pyramid Type
16' x ¾" Niles Pyramid Type
20' x 1" Hilles & Jones Pyramid Type

BRAKES—LEAF TYPE
8' x 3/16" Dreis & Krump
12' x ¼" Dreis & Krump
12' x ⅜" Dreis & Krump

BRAKES—PRESS TYPE
10' x ¼" Superior Hydraulic—NEW
10' x ½" Superior Hydraulic—NEW
12' x ½" Superior Hydraulic—NEW

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton Whiting	48' Span 220/3/60 A.C.
5 ton Shaw	56' Span 230 Volt D.C.
10 ton P&H	38' Span 230 Volt D.C.
10 ton Cleveland	47' Span 440/3/60 A.C.
15 ton P&H	48' Span 230 Volt D.C.
15 ton Morgan	70' Span 220/2/60 A.C.
15 ton P&H	72' Span 230 Volt D.C.
25 ton Cleveland	70' Span 220/2/60
120 ton Niles	68' Span 440/3/60 A.C.

DRAW BENCH
10,000# Aetna Standard, Length of Draw 44', Used to draw SAE 1035 Welded Steel Tubing

FORGING MACHINES
1" to 5" Acme, Ajax, National
3" Acme Model XN, Air Clutch, NEW 1954

GRINDER—ROLL
20" x 96" Landis, Crowning Drive

HAMMERS—BROAD DROP—STEAM DROP—STEAM FORGING—800 lb. to 20,000 lb.

LEVELLERS—ROLLER
48" Kane & Roach 11 Rolls 4" O.D.
48" Aetna Standard, 17 Rolls 3⅜" Dia.
52" McKay, 17 Rolls 4" Dia.
54" McKay, 17 Rolls 3⅜" Dia.
Budd-McKay Sheet Processing Machine & Roller Leveler, 15 Rolls 72" x 4⅛" Dia.

PLANER—PLATE EDGE
30' Southwark, 1¼" Capy. 16 Pneu. Jacks

PRESSES—HYDRAULIC
500 ton Elmes 18" Stroke Lower Platen 38" x 66"
750 ton Baldwin Triple Acting Bolster 84 x 133"
1200 ton United Steam Hydraulic Forging Press
4500 Baldwin-Lima-Hamilton Hydr. Forging Press

PRESSES—HYDRAULIC WHEEL
600 ton N-B-P, 96" Between Strain Bars
800 ton N-B-P, 96" Between Strain Bars

PRESS—INCLINED
125 ton Beatty Open Back 1½" Stroke, Area of Bed 28⅞" x 26⅞"

PRESSES—STRAIGHT SIDE
Cleveland 1T-48 Double Acting, 20" Stroke of Slide 14" Stroke of Blankholder, Bolster 48x48"
Toledo 203E Overhanging, 10" Str. 38x40" Bolster
250 ton Bliss 89, 20" Stroke, Bolster 30"x30"
190 ton Toledo 58A, 14" Stroke, Bolster 36"x36"
170 ton Bliss 57", 14" Stroke, Bolster 32"x32"
150 ton Toledo #64½-60, 6" Stroke, Bolster 36"x60"
105 ton Toledo 56, 5½" Stroke, Bolster 25"x25"

PUNCH & SHEAR COMBINATIONS
#44 x 48 Buffalo RAP, Capacity ⅛" x ⅝"
Cleveland Style EF Single End, 42" Throat
Cleveland Style G Single End, 60" Throat
No. 1½ Buffalo Universal Ironworker

ROLLS—FORMING
M1½-H Yoder 10 Stand, Roll Shaft Dia. 1¼"
Model 14 L-M-1 Tishken Roll Forming Machine 1½" Dia. Spindle, 3¼" Capacity, With Cut-Off

ROLLS—PLATE STRAIGHTENING
72" Bertsch Seven Rolls, 7" Dia.
12' Newbold, Nine Rolls 14" Dia.

ROLLING MILLS
18" Three High Bar Mill
12" x 12" Single Stand Two High
16" x 24" Farrel Two Stand, Two High
16" x 30" Single Stand Two High
26" x 54" United Single Stand Two High
26" x 72" Cold Rolling Mill
44" x 144" Three High Sheet Mill
22" x 40" Three High Sheet Mill

SHEARS—SQUARING
6' x 10 Ga. Niagara No. 672
8' x ¼" Niagara—NEW 1952
10' x ⅜" Niagara—NEW 1950
16' x 3/16" Long & Alstatter

SHEAR—MISC.
Lowey Flying Shear with ratchet driven measuring rolls, Capacity .125" x 36" wide

SLITTERS
12" Blake & Johnson
36" Wean Slitting Line
32" Stamco Slitting Line

SWAGING MACHINE
#6½A Fen. Capacity 2¼" Tube, 3¾" Solid 10" Die Length Hydraulic Feed, LATE

TESTING MACHINES
20,000# Baldwin Universal Hydraulic
60,000, 100,000, 200,000 Olsen & Riehle Universal
50,000 and 300,000 lb Compression

TUBE MILL
Elna 1K Welded Tube Mill, Cut-Off & Transformer Capy. ½" OD 0.28 wall to 2" OD .120 wall

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SLIP RING MOTORS
Constant Duty 3 Phase 60 Cycle

Qu.	H.P.	R.P.M.	Make	Type	Volt
1	100	430	Al. Ch.		220/440
2	100	495	G.E.	IM-15A	2300
1	100	570	G.E.	MT-562	220/440
1	100	870	Whse.	CW	220/440
1	100	900	El.Dy.	EDX613	2300
1	100	1160	Whse.	CW	220/440
1	100	435	Whse.	CW1000	220/440
1	150	490	Whse.	CW	220/440
1	150	585	Whse.	CW	4160/2200
1	150	705	Al. Ch.	ANY	220/440
1	200	490	G.E.	IM-14	2200
2	200	585	G.E.	IM-16	2200
1	200	1760	G.E.	IM-13B	2200
1	250	360	G.E.	MT-414	2200
1	250	705	Al. Ch.	ANY	220/440
1	350	450	G.E.	MT-412	2200
1	400	290	Whse.	CW	2200
1	400	505	Al. Ch.	ANY	2200
2	450	440	Whse.	CW	2200
1	500	450	G.E.	IM	2300
2	500	505	Al. Ch.	ANY	2300
1	700	295	Whse.	CW	2300
1	750	400	G.E.	IM	2200
1	1000	445	Whse.	CW	2300
1	1500	366	G.E.	Mill type	2300
1	1800	270	Whse.	Mill type	6600/4000
2	2500	257	G.E.	Mill type	2300

SYNCHRONOUS MOTORS
3 phase—60 cycle

Qu.	H.P.	R.P.M.	Make	Type	Volt
1	2500	720	Whse	.8 PF	2200/4160
1	2000	900	Whse.	.8 PF	2200
1	1500	514	Whse.	.8 PF	2300
1	1000	1200	El. Mchy.	.8 PF	440
1	1000	900	G.E.	.8 PF	2300
1	710	720	G.E.	.8 PF	440/2300
1	450	128	Whse.	1.0 PF	2200
1	300	720	G.E.	TS 982	440/2300
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1	200	360	Al. Ch.	1.0 PF	440/2300/4
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1	150	720	El. Mchy.	.8 PF	220/440
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1	1100	F.M.	OVZK, B.B.	4800	1800
1	1000	A.C.	Mill	2300	240
1	800	G.E.	MT	2300	293
1	750	G.E.	MT-573	2200	1190
1	700	A.C.		2300	500
1	500	Whse.	CW	550	350
1	400	Whse.	CW	440	514
1	350	G.E.	IM-17A	440/2200	720
1	250	G.E.	MT-424Y	4000	257
1	250	Cr. Wh.	Size 290	2300	350
1	250	Al. Ch.		550	600
1	200	G.E.	IE13 B-M	220/440	1760
1	200	G.E.	MT-557Y	220/440	1760
1	200	Cr. Wh.	20QB	440	505
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1	200	G.E.	IM	2200	580
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1	100	G.E.	IM	440	600
4	100	A.C.	ANY	440	695

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1	650	G.E.	FT-559BY	440	3570
2	450	Whse.	CS-1420	2300/4150	354
1	400	G.E.	IK	2200	500
1	300	G.E.	KT-559A	2300	1775
1	200	G.E.	IK-17	440	580
2	200	G.E.	KT-557	440	1800
1	150/75	G.E.	IK	440/900/450	
1	150	Whse.	CS856S	440	886
1	150	Whse.	CS	440	580

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Qu.	H.P.	Make	Type	Volts	RPM
1	7000	G.E.	ATI	2200/6600	600
1	4350	C.W.	3561SLI	4000/6900/13800	514
1	2850	Whse.	.8p.f.	2300/4600	514
1	2800	Whse.	.8p.f.	2300	720
2	2000	Whse.		2300	120
2	1750	G.E.	ATI	2300	3600
1	735	G.E.	ATI	2200/12000	600
1	450	Whse.		2200	128.5
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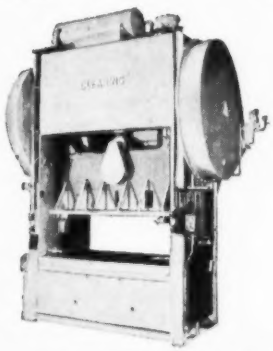

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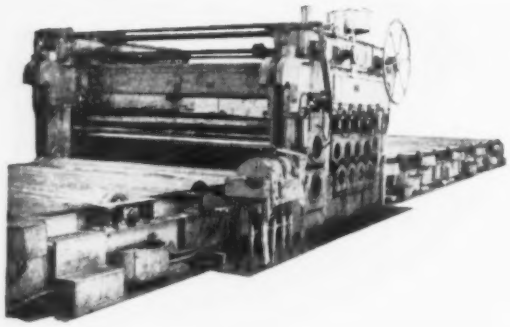

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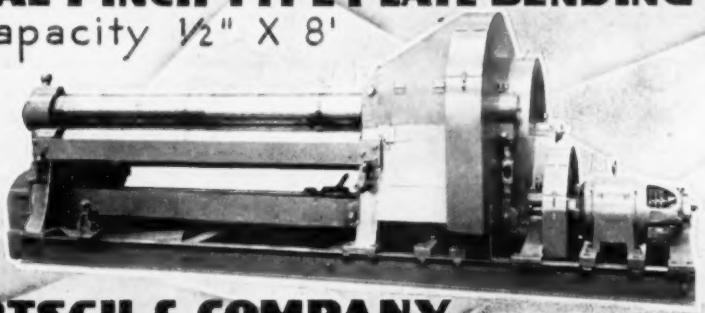

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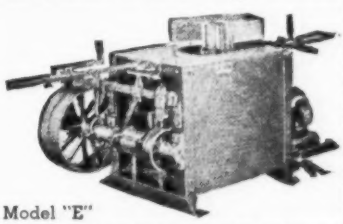

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December Steel Output Record Falls

Steelmaking furnaces in the U. S. poured 10,840,000 net tons of ingots and steel for castings during December, the American Iron and Steel Institute reports. It is a record for that month. This brought the total steel output for the year to 115,218,604 net tons, second only to the 1955 record of 117 million tons. December production was over 300,000 tons above that of December, 1955.

J & L To Shut Down Coal Mine

Jones & Laughlin Steel Corp. will close its Vesta No. 4 coal mining operation near California, Pa., on April 1. The move will mean the layoff of 790 men. Closing is due to depletion of coal at the No. 4 location. J & L says it will continue to operate the Vesta No. 5 property and that production of the Shannopin mine at Poland, Pa., will be expanded. In addition, J & L will increase purchases of southern West Virginia coal by 15 pct.

Air Force Awards $150 Million In Contracts

The Aircraft Engine Div., Ford Motor Co., was awarded three contracts totaling $137,159,416 by the Air Force. They include $127,459,416 for J-57 turbojet engines; $5.2 million for J-57 production facilities at the division's Dearborn, Mich., plant and $4.5 million for additional facilities. Other contracts totaling almost $13 million were awarded to five other companies. They are General Motors Corp., Allison Div.; Curtiss-Wright Corp., Dresser-Ideco, General Precision Laboratories, and Brown-Olds Plumbing.

Ike's Budget Has Social Side

President Eisenhower's budget calls for several new major social programs, as well as expansion of existing ones. Among them: extension and improvement of the unemployment compensation program; extension of the minimum wage-hour law; revision of the eight-hour laws, and a new equal pay for equal work law; a modest system of grants to permit states to improve occupational safety laws; a law to require registration of employee pension and welfare funds; consolidated wage and social security reporting; and a program to aid distressed areas.

ODM Hikes Second Quarter Steel Needs

Defense production needs for steel, aluminum and nickel alloys are to rise slightly in the April-June quarter, compared with current quarter requirements. Copper and copper base alloys allotments to defense work are to go up about 17 pct. Some comparative figures: steel, from 552,626 short tons in first quarter to 561,619 in second; aluminum, from 120 million lb to 123 million lb; nickel, from 9.6 million lb to 9.8 million lb.

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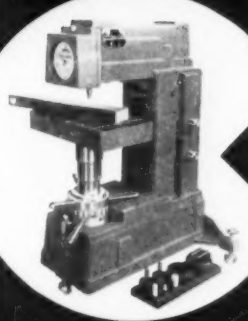

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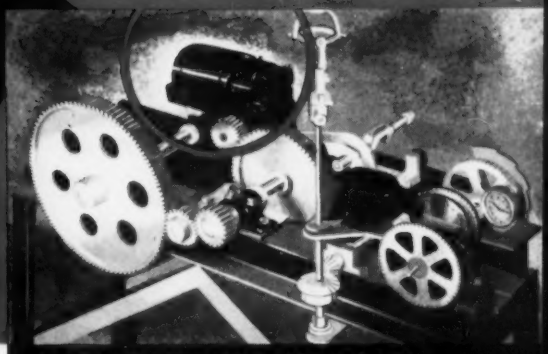

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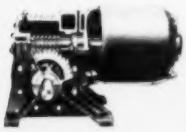

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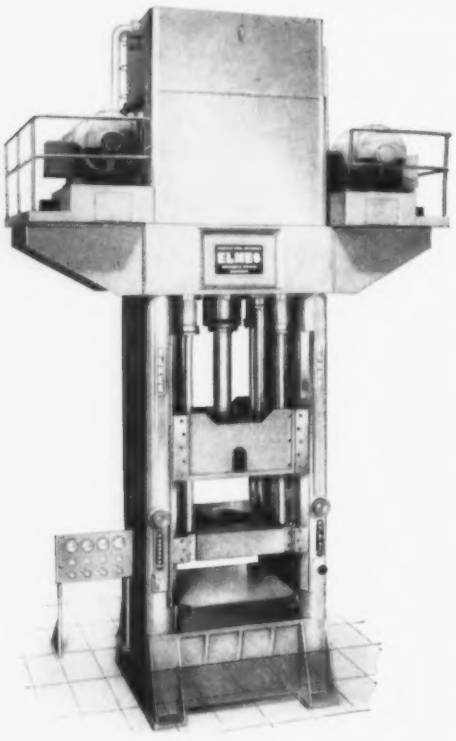

Those tough production problems that require something extra in drawing, forming, bending, hobbing, forging or other press performance are just the kind that Elmes engineers like to be called in on. More than 60 years in the specialized field of hydraulics has built the Elmes reputation for recommending and supplying hydraulic presses that are "job-fitted" for profit-making performance, no matter how special the job.

While a wide range of standard Elmes Press designs meet all usual requirements in drawing, forming and other press work, the development of special presses "job-fitted" to the customer's exact requirements is a major part of Elmes engineering service. Whatever your pressing problem, it will pay you to call in Elmes for consultation and recommendations. Distributors in principal cities.

American Steel Foundries

Elmes ENGINEERING DIVISION

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